

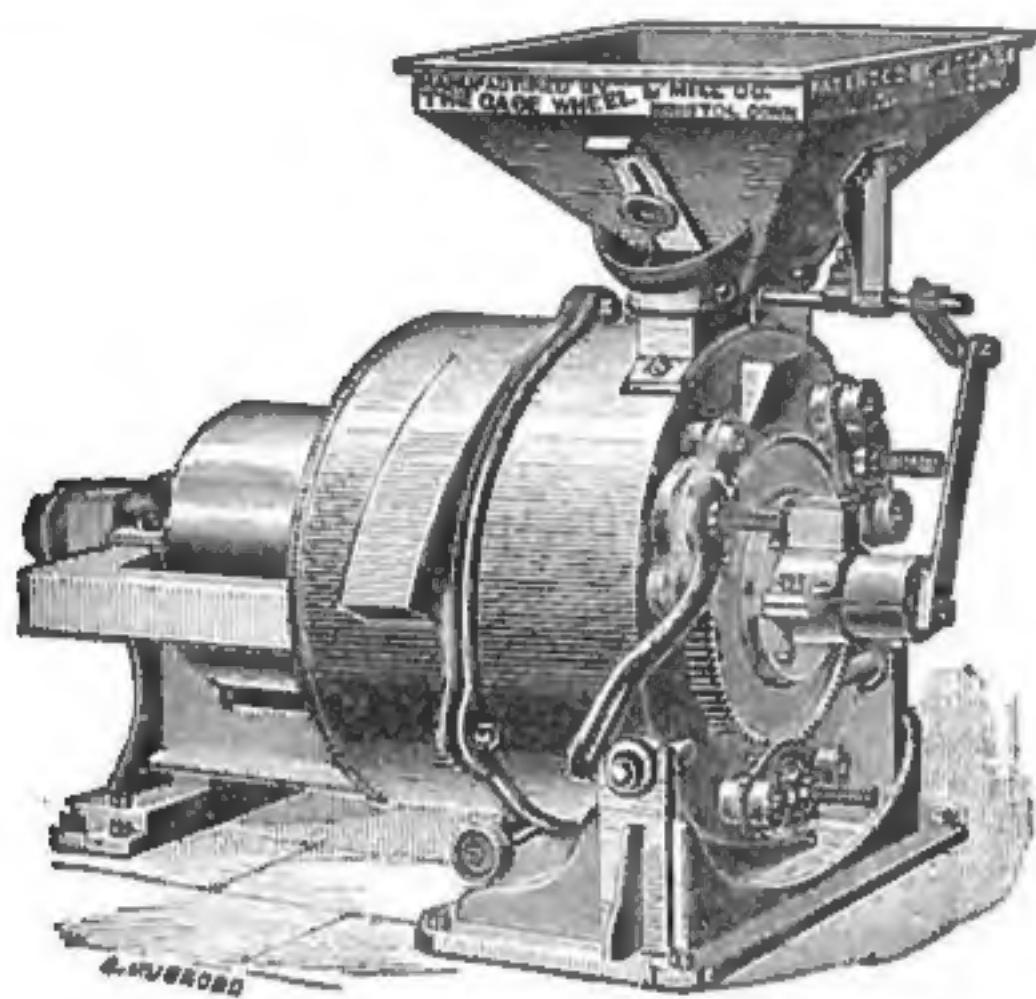
CHRONICLE OF THE GRAIN AND FLOUR TRADE

PUBLISHED EVERY MONDAY MORNING.

VOL. XXI. No. 25.

BUFFALO, N. Y., FEBRUARY 17, 1890.

\$1.50 PER YEAR.



VICTORY OVER ALL OTHERS.

SINGLE & DOUBLE VERTICAL GRINDING MILLS.

(J. T. CASE'S PATENT.)

FACTS ARE MIGHTIER THAN ASSERTIONS. READ WHAT THEY SAY:

"Our 20-inch mill made by the Case Wheel & Mill Co. is in every respect satisfactory, easy to handle, and best results obtained of any mill in the country, with same quantity coal and power." — A. S. RUSSELL & CO., Meriden, Conn.

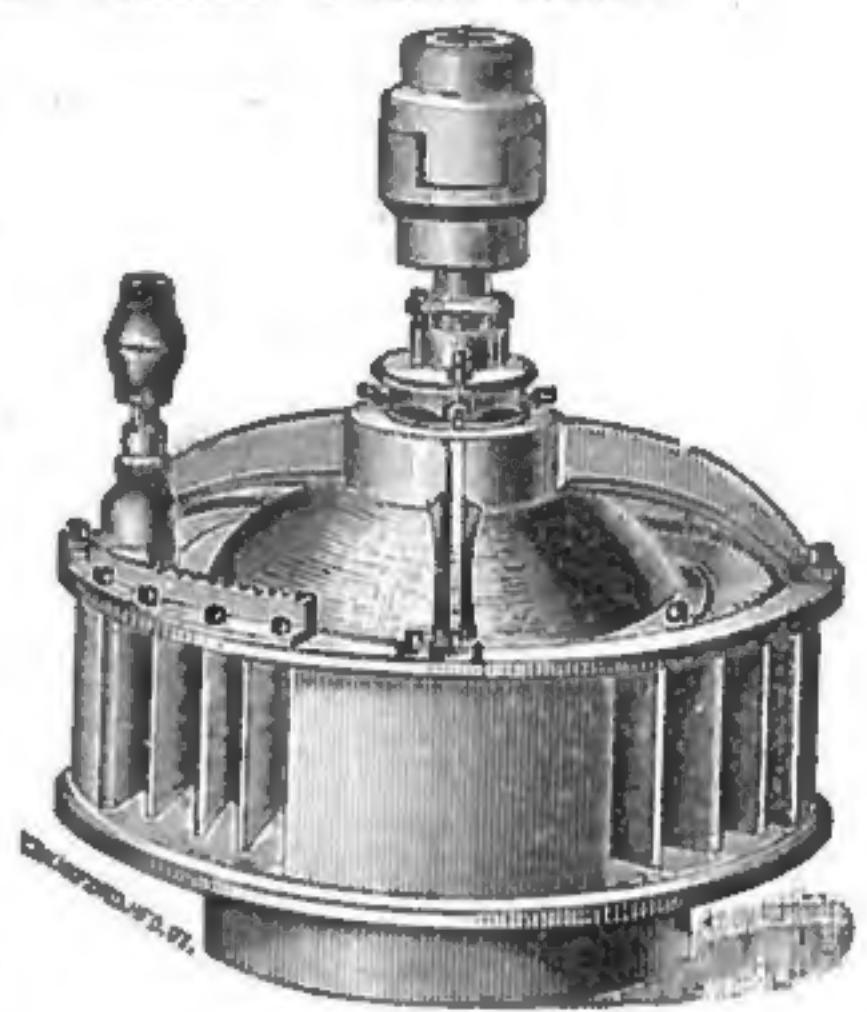
"Superior to any mill in use." — GEO. WESTON, Bristol, Conn.

"The best satisfaction in quantity and quality." — CHILD'S ELEVATOR, Manchester, Ct.

"We take pleasure in recommending it." — GARLAND, LINCOLN & CO., Worcester, Mass.

SEND FOR CATALOGUE—ILLUSTRATED AND DESCRIPTIVE.

The Improved National Turbine Water Wheel



The Best for Economy; The Best for Durability; The Best for Power. ONE THOUSAND FIVE HUNDRED NATIONAL WATER WHEELS IN USE Prove that our Assertions are Supported by the Leading Manufacturers in the Country. Send for illustrated catalogue and prices to the manufacturers.

The Case Wheel & Mill Co., Bristol, Conn.

THE "KEYSTONE" ROLLER MILL BEATS THEM ALL.

THE PROOF.

NORTH SALEM, IND., Dec. 8, 1888.

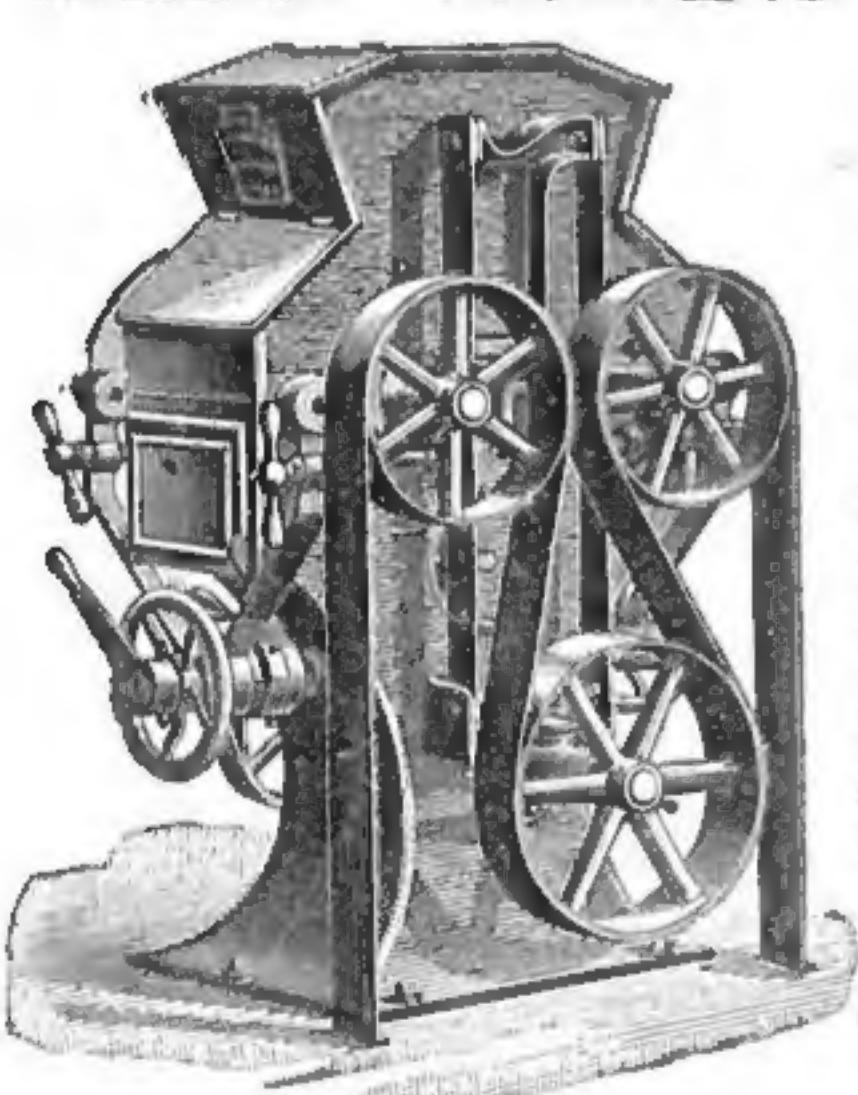
DEAR SIRS: It has been a year since we started up the 50-barrel mill you built for us. We make four breaks on wheat, and will just say that we never, in our lives, seen or used any machinery for the manufacture of flour equal to this which you put in for us. The Roller Machines (Allfree's patent) can't be beat in the world for simplicity of construction. They have the best adjustments of any mill known, and we think we know whereof we speak. We have not had a break nor a jar since we started. We defy any man, or set of men, to produce a system of separation that will beat the Allfree System. We make two grades of flour which we call the first, or baker's flour, and the other the low grade; and out of the tests we have made, have, on a fair test from 60 lbs. of wheat, 44 lbs. of Crown Prince, or baker's flour, and 2 lbs. of low grade. Our Crown Prince sells a little higher in the market than other grades from other mills, and we have been complimented on our flour quite often, as it is always in demand. It takes less power to run this machinery than any we have seen; it will do more grinding, and do it easier than any mills we have used with the same amount of power. Our mill is built for a fifty-barrel mill. When the wheat is in good condition we make 65 barrels, and do it easy. Our trade has increased from the very start, and we have not had a single complaint. Our stock from this mill is always in demand, and we will say that if our brother millers want to get what there is in the wheat out of it, and get a flour that can't be beat anywhere, they had better adopt the Allfree System, for it will save them money dead sure. On the Allfree Rolls we have a double adjustment; we can set both ends of the rolls separate from each other, or, with a single hand wheel, change the whole roll at the same time. The adjustments on these rolls are worth two other makes, and if there is any miller who doubts this let him come and visit us and he can see for himself; we will take pleasure in showing any body that will come and see this mill work. Millers are always welcome.

We remain yours,

DAVIS & CLARK.

ADDRESS

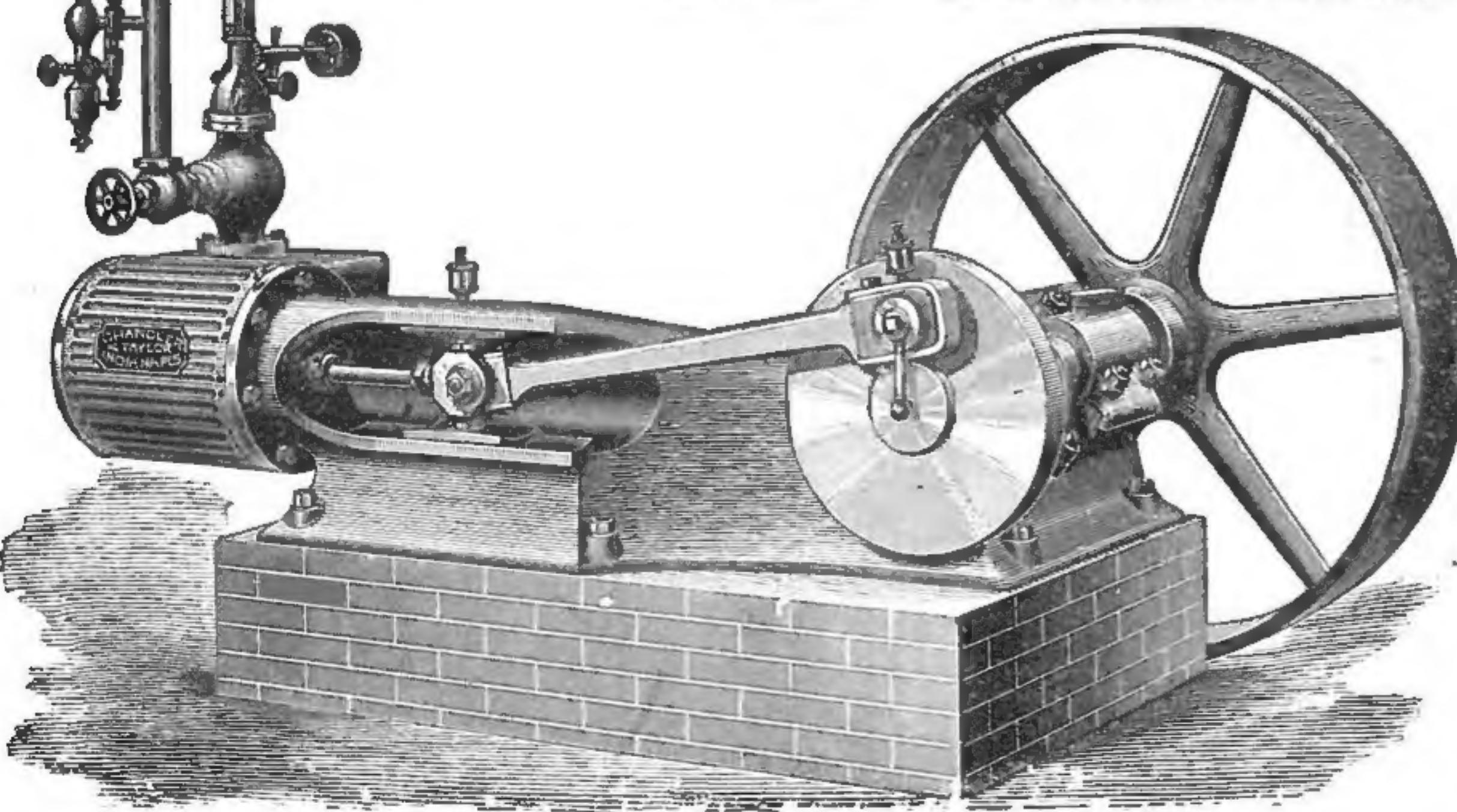
THE J. B. ALLFREE CO., 76 to 86 Shelby St., INDIANAPOLIS, IND.



SELF-CONTAINED STEAM ENGINES Stationary or Semi-Portable.

High Standard Maintained.
Prices Greatly Reduced.

WRITE FOR NEW ILLUSTRATED
CATALOGUE NO. 32.



Chandler & Taylor Co.
Indianapolis, Ind.
Engines, Saw-Mills and Drain Tile
Machinery a Specialty.

CASE.

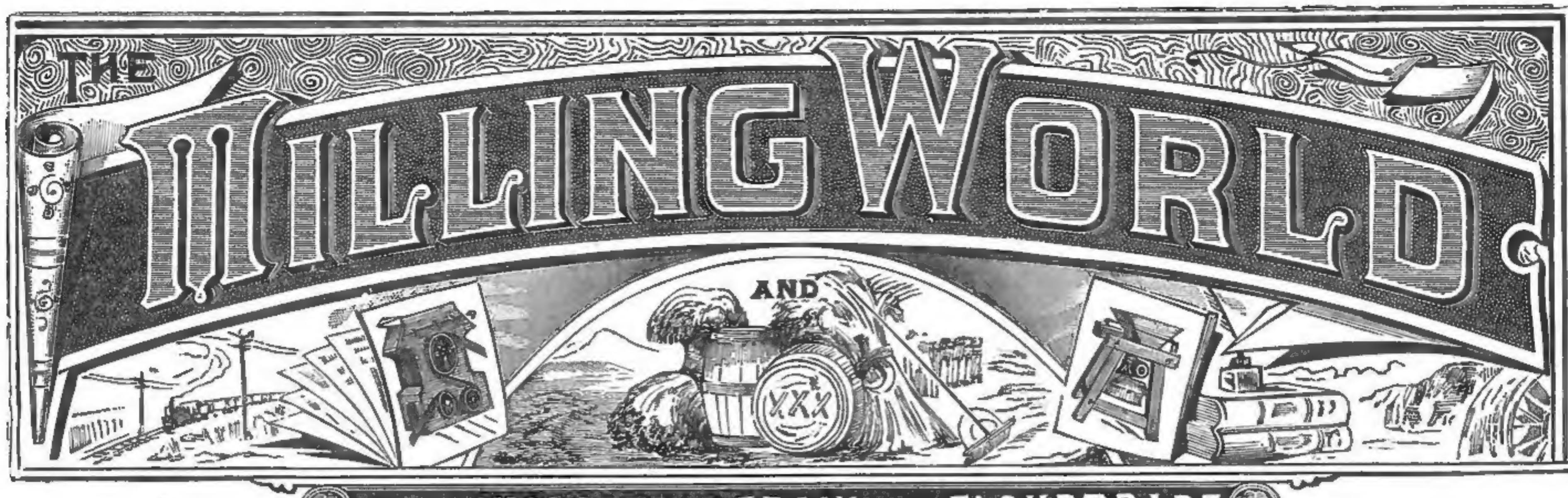
W. C. MANSFIELD & CO.
MERCHANT MILLERS, 29, 1889.
CLEVELAND, TENN., AUG. 29,
MERCAND, TENN., AUG. 29,

CASE MFG. CO., COLUMBUS, O.
GENTLEMEN: If we were to build a hundred mills we
would not permit any other than the best roll on earth.

W. C. MANSFIELD & CO.

CASE MFG. CO., COLUMBUS, O.
GENTLEMEN: If we were to build a hundred mills we
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CASE.



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BUFFALO, N. Y., FEBRUARY 17, 1890.

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ATTENTION is called to the new advertisement of the Brooklyn Wire Cloth Works, 107 John street, New York, N. Y., which appears in this issue. This is a standard house. Address them for price-lists and descriptions of their goods.

THE prices of wheat and wheat flour continue to sag, despite the assertions of the "experts" that the market "is statistically stronger than it has been for years." This statistical position business is exceedingly unsatisfactory. What we want and need is a stronger position so far as actualities are concerned.

DURING the six months from August to February, 1887-'88, Russia shipped to Europe 50,496,000 bushels of wheat, against 5,296,000 bushels from India and 59,488,000 bushels from the United States. In the same period in 1888-'89 Russia shipped 51,728,000 bushels, against 14,592,000 bushels from India and 39,088,000 bushels from the United States. In the same period in 1889-'90 Russia shipped 43,712,000 bushels, against 13,974,000 bushels from India and 46,408,000 bushels from the United States.

THE January fire-losses in the United States and Canada footed \$9,180,000, against \$6,899,000 in 1889, against \$16,040,000 in 1888 and against \$11,550,000 in 1887. The milling and allied industries were taxed \$994,000 for the January losses this year. Mills and grain-elevators appear to be a very burnable class of property. Elevators in particular seem to invite conflagration. During the past thirteen months nearly fifty elevators, large and small, have been burned in the United States and Canada, entailing a total loss of about \$2,600,000.

EUROPEAN journals are printing statements that indicate an exportable surplus of 10,000,000 to 20,000,000 bushels of wheat on the crop now being harvested in the Argentine Republic. Of course not even the lowest figure will be realized, but these statements are made at this time with the view of frightening holders of wheat in the United States into "shelling out" their holdings at the present low prices. It will be well not to go too fast in accepting interested European bear reports on wheat in the Argentine Republic or anywhere else.

THIS unusually open and warm winter will, in all probability, be followed by a summer quite as capricious and unseasonable. It is certain that the insect pests in the winter wheat will be greatly intensified. Already the reports indicate numerous signs of increase in the wheat pests, and it is probable that this peculiar winter means a decidedly short, and possibly a very poor, crop of winter wheat next season. Europe has also a capricious winter, and the conditions in the Northern Hemisphere are decidedly not favorable to the winter-wheat crop.

THE Minneapolis "Yahoo," unable to repress its currish instincts, makes the failure of the George T. Smith Middlings Purifier Company the text for an outrageous onslaught on Mr. Smith, and even publicly rejoices over the disaster that has fallen on that gentleman and his establishment. There is nothing needed to show the malignity of the "Yahoo"

writers and managers. The evidence is full and incontrovertible. It is charitable to suppose that the person who wrote that uncalled-for and useless attack on Mr. Smith may yet feel ashamed of the work. We extend our sympathy to the Smith Company, and we hope they will be able to go on with their business.

THE Winnipeg, Manitoba, Grain and Produce Exchange sends out a report for 1889, which judiciously omits the crop figures of 1889. According to this report, Manitoba in 1888 exported 5,000,000 bushels of wheat, against 10,000,000 bushels in 1887. The report also asserts that in "average" years Manitoba should raise 15,000,000 to 20,000,000 bushels. Now how will Manitoba "average" its years to make it appear that it can grow even the smaller of those amounts, seeing it has never reached an output nearly so large? Manitoba figures and assertions should be kept as closely as possible to facts and possibilities. Nothing will be gained by misrepresentation, concealment or exaggeration. Tell the truth, and then the event can not shame you, Messrs. Winnipeg-Manitobans!

IT is coming! The Interstate Commerce law is doomed. Body after body of business men is petitioning for its repeal. Among recent converts to the truth that that law is a failure and an intolerable fraud is the Indianapolis board of trade, which recently adopted unanimously a resolution that "the law has failed to accomplish the ends intended." The board appointed a committee to prepare a petition to Congress to repeal the law. It would be a fine stroke of irony, when the people finally become aroused to the iniquity of that law and are demanding its repeal, to find the railroads fighting to keep the law on the statute books and to enforce it. The railroads are the only beneficiaries of the enactment. Of course, they have been harmed by it in some ways, but in other ways they have been really benefited by it. The public has received nothing but damage from it. The repeal should not be long delayed.

BELIEVERS in the Indian wheat bugaboo are having a good deal of labor to retain their faith in that unsubstantial phantom. English investigators, who have been studying the wheat question in India, are finding some apparently insurmountable difficulties in the way of the Asiatic farmers. 1. Their soil is worn out. 2. They have no fertilizers at hand, excepting bones and manure. 3. They can not use the manure for fertilizing, as they are compelled to burn it for fuel, having nothing else to burn. 4. They can not use bones as manure, being forbidden to do so by their moss-covered religion. 5. Insect pests are numerous and overwhelming in the larger part of India. 6. The seasons are very capricious. 7. Every social, financial, commercial and religious condition is a check to development. The British investigators appear to be hopeless. Add to all these drawbacks the bad quality of even the best Indian wheat, the lack of transportation facilities and the inevitable 5 or 10 per cent. admixture of hair, wool, dung, dirt, gravel, sticks, straws and other superfluous and valueless Indian sweepings found in grain sent out from India, and it is easy to understand the sudden cessation of growth in the Indian wheat enterprise.

Dawson's Roller Mill

Is acknowledged to be the very best in the market. It has our Patent Automatic Centrifugal feeder, never failing to feed the stock the full length of rolls in an even sheet. It is the Latest and Best feed out, uses less power and is simple in construction. It can be placed on any style of machine with little expense. We use for roll bearings phosphor-bronze metal which will admit rolls being run at any speed without heating and with little friction, and uses little oil. We use the Dawson Corrugation, which is admitted the best in long or short system mills as the action is granulating rather than CUTTING.

We have a large plant to Re-grind and Re-Corrugate Rolls.

Owing to our late increased facilities and central location we are enabled to ship goods promptly on the shortest notice.

PARTIES CONTEMPLATING REMODELING THEIR MILLS OR BUYING ANY ROLLER MACHINES ARE REQUESTED TO PUT THEMSELVES IN CORRESPONDENCE WITH US.

FOR PRICE LISTS AND CIRCULARS, ADDRESS,

Dawson Roll Works, Harrisburg, Pa.

The Cowles "Reliable" Sectional Wood Pulley

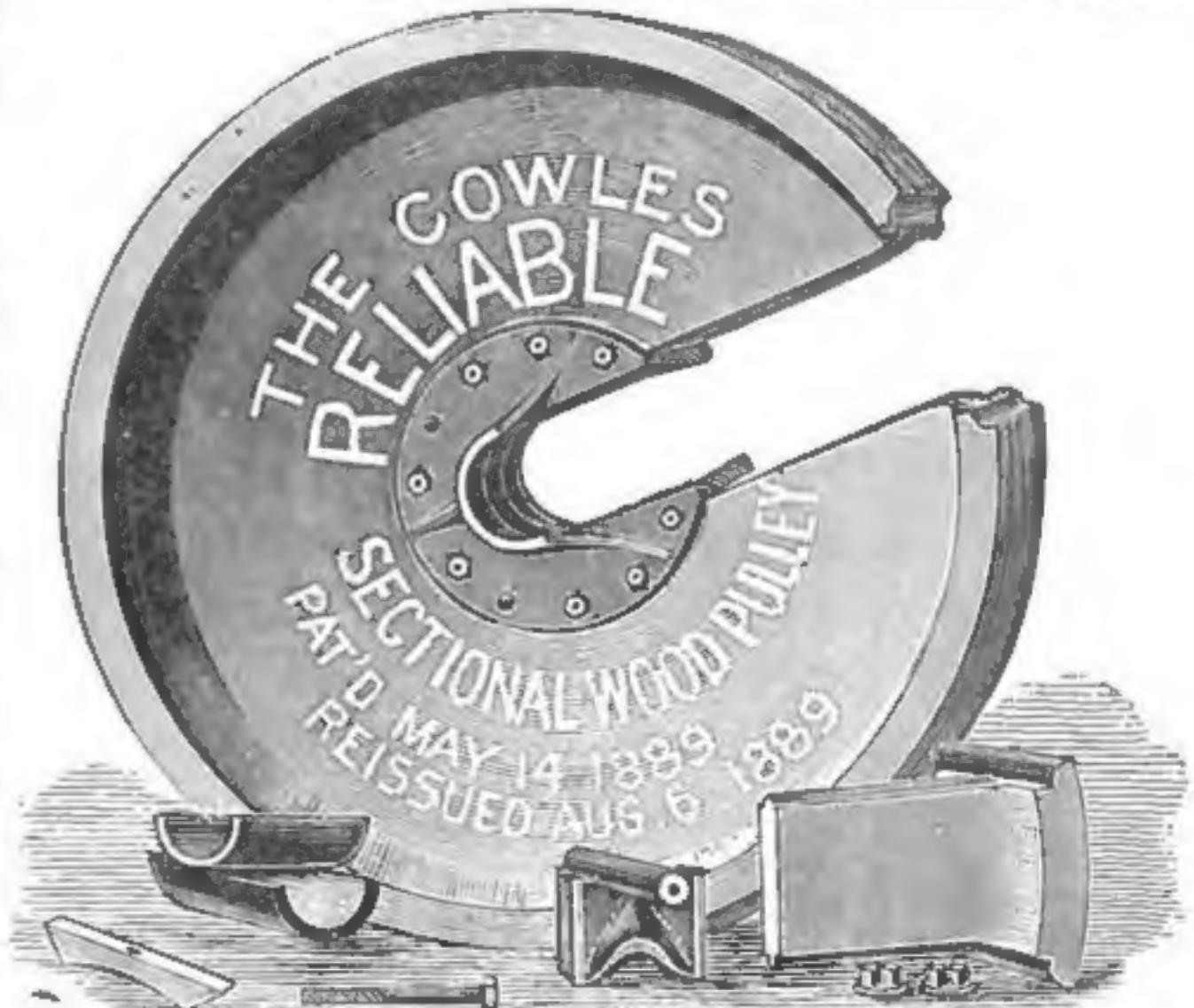
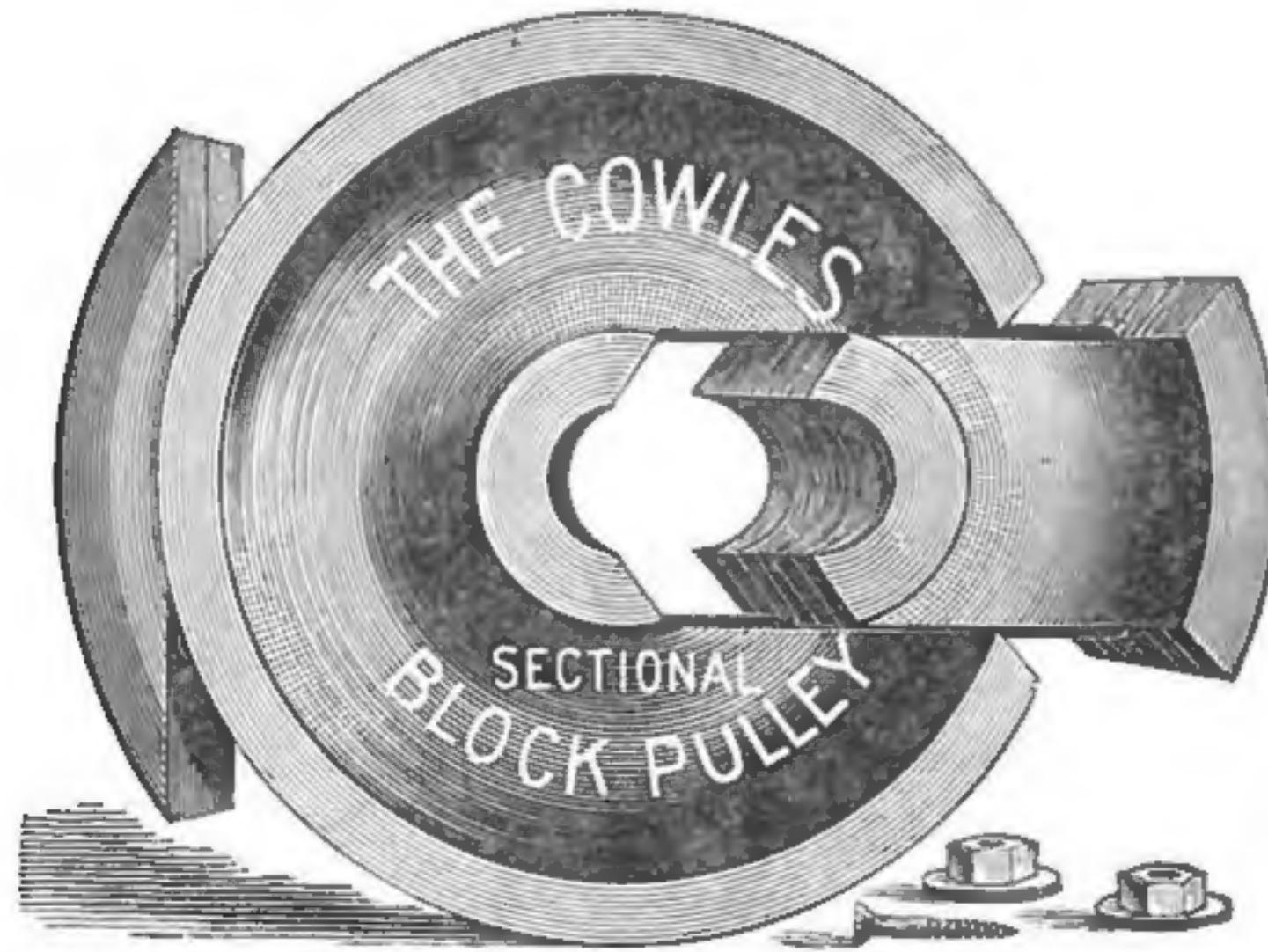
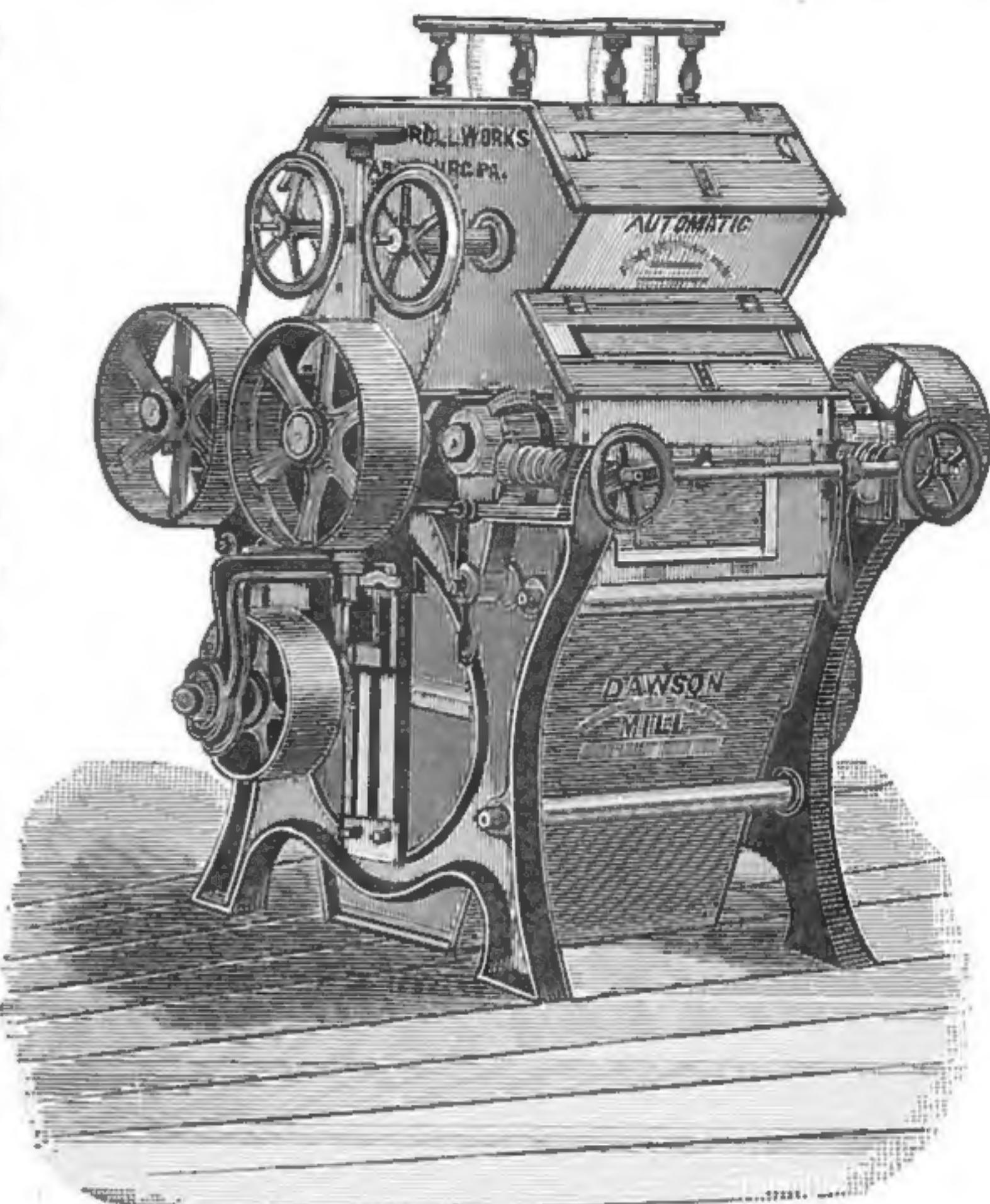


Web made of several layers glued together with grain crossing, and faced up on both sides. Iron flanges securely bolted to web. Rim put on after web has been trued up. Web and rim turned on inside and face, making perfect running pulley. Rim supported entire circumference. Positive self-gripping device for securing pulley to shafting, which is self-centering, and can not slip with wear.

A wooden rim pulley transmits from 30 to 50 per cent. more power with same belt than an iron one.

Two-thirds lighter than iron, bearings will wear longer and the expense for lubricant will be less.

Having solid web, there is no air resistance. The "Reliable" can be placed on shaft or position changed in one-fourth the time required with any other pulley.



EDWARD GERMAIN, SOLE MANUFACTURER

SAGINAW, MICH., U.S.A.

MILLING WORLD

AND
CHRONICLE OF THE GRAIN AND FLOUR TRADE

PUBLISHED EVERY MONDAY. Offices: Corner Pearl and Seneca Streets, Over Bank of Attica.
McFAUL & NOLAN, - - - PROPRIETORS.
THOMAS MCFAUL. JAMES NOLAN.

SUBSCRIPTION.

In the United States and Canada, postage prepaid, \$1.50 Per Year, in advance; remit by Postal Order, Registered Letter, or New York Exchange. Currency in unregistered letter at sender's risk.

To all Foreign Countries embraced in the General Postal Union, \$2.25 Per Year, in advance.

Subscribers can have the mailing address of their paper changed as often as they desire. Send both old and new addresses. Those who fail to receive their papers promptly will please notify at once.

ADVERTISING.

Rates for ordinary advertising made known on application.

Advertisements of Mills for Sale or to Rent; Partners, Help or Situation Wanted, or of a similar character One cent per word each insertion, or where four consecutive insertions are ordered at once, the charge will be Three cents per word. No advertisement taken for less than 25 cents. Cash must accompany all orders for advertisements of this class.

Orders for new advertisements should reach this office on Friday morning to insure immediate insertion. Changes for current advertisements should be sent so as to reach this office on Saturday morning.

EDITOR'S ANNOUNCEMENTS.

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trade.

Correspondents must give their full name and address, not necessarily for publication, but as a guarantee of good faith.

This paper has no connection with a millfurnishing house and aims to represent the trade without prejudice, fear or favor.

Address all communications

THE MILLING WORLD, BUFFALO, N. Y.

Entered at the Post Office, at Buffalo, N. Y., as mail matter of second-class.

SITUATIONS WANTED.

Advertisements under this head, 25 cents each insertion for 25 words, and 1 cent for each additional word. Cash with order. Four consecutive insertions will be given for the price of three.

WANTED.

A situation in some flouring or grist mill, by a man who has had good experience with the buhr system. Can furnish best of references. Address, THOMAS H. NICHOLAS, DeRuyter, N. Y. 2225

SPECIAL ADVERTISEMENTS.

Advertisements of Mills for Sale or Rent, Partners Wanted, Machines for Sale or Exchange, etc., etc., cost 1 cent per word, for one insertion, or 3 cents per word for four insertions. No order taken for less than 25 cents for one insertion, or 50 cents for four insertions. Cash must accompany the order. When replies are ordered sent care of this office 10 cents must be added to pay postage.

FOR SALE.

Mill property in Central New York, for much less than it is really worth, with small payment down, or would take a partner with small capital to take charge of and run the mill. Address "B," care of THE MILLING WORLD, Buffalo, N. Y. 2024

FOR SALE OR TRADE.

For a good farm, Mill Property in Northern Indiana; has been overhauled within three years, with all new machinery. Good water-power and splendid custom trade; 2½ miles from station. Has three run of stones. Address, "Z," care of THE MILLING WORLD, Buffalo, N. Y. 24

FOR SALE.

Several good second-hand and new turbines of various styles. Second-hand price list and descriptive matter and prices of our new machines sent free. Every one interested in the shortest route to successful milling on rolls or in grinding corn and feed with the least expense of power, should address us before buying.

FLENNIKEN TURBINE CO., Dubuque, Iowa.

8tf

MILL MACHINERY FOR SALE.

One No. 0 Standard Combined Separator, Smutter and Brush Machine; new, best make. One 20-inch Under-Runner Portable Mill, French Buhr Stone, capacity 10 to 12 bushels per hour; new, best make. One 14-Inch Vertical Feed Mill; best make, new, a bargain. One No. 8 Dustless Separator; new, a bargain. One No. 1 Full Rigged Combined Dustless Separator; new, a bargain. Four Corn Cob Crushers, right or left hand, driven from above or below, best make; capacity 40 to 60 bushels per hour. Three No. 1 Corn Shellers, capacity 200 to 300 bushels per hour; new. One No. 2 Purifier. New. Best make. A bargain. For particulars address, FRANK SMITH, care of THE MILLING WORLD, Buffalo, N. Y. 5tf

FOR SALE CHEAP.

One 36-In. Iron Frame Portable Mill, French Burr Stone. Used about 2 months.

One 20-In. Vertical Mill, French Burr Stone, Used about 30 days.

Three Pair 42-In. Old Stock Feed Stones.

FOR PARTICULARS ADDRESS,

SAMUEL CAREY, 17 BROADWAY, NEW YORK.

FOR RENT.

Clinton Mills, at Black Rock, Buffalo, for rent on reasonable terms, recently repaired and put in good order. Apply to CHAS. DANIELS, over 811 Main Street, Buffalo, N. Y. 6tf

FOR SALE.

Flour and feed mill, with water power and three run of stones, for sale cheap; also dwelling house and garden. Situated half a mile from depot on New York and New England R. R. For particulars, address, MRS. M. E. DOUGHTY, Green Haven, Dutchess County, New York. 2427

INSURANCE men are paying more and more attention to their risks on grain-elevators and flouring-mills. Can they be blamed for doing so?

WHEN the Minneapolis "yahoo" talks about the Jackson failure and prates about business built up by disreputable means, it inevitably invites attention to its own career and methods. Silence would be a sign of discretion, but the "yahoo" has never been famous for discretion.

SPRING continues to linger in the lap of winter. Present indications are that we shall come to the blossom days with no ice stored for summer and with winter wheat about two months ahead of time. It will be marvelous if no "cold snap" falls on the country just when it will do the most serious damage. The situation is bad.

BRITISH millers are learning from Mr. J. Murray Case some valuable points in milling. His views on demonstrated and disputed points in flour-making are entitled to great attention and respect, as he is one of the foremost inventors and milling engineers of the century. He is not only a scientific and theoretical miller, but also a practical miller, so that there is not an essential point in the great industry that is not a familiar point to him.

EVERY time the Bogus Resolution fanatics refer to the matter, they recall attention to the fact that no attempt has ever been made to impeach the integrity of the Buffalo reporter who copied and published the Smith resolution, and who made his affidavit that the resolution published was the resolution read to and adopted by the Buffalo convention. Let the Bogus Resolution fanatics remember this single fact, and probably they will in time cease to take an insane delight in showing up their own dubious doings.

IT is all very well to call the present winter a phenomenal season, but there have been other winters even more remarkable. History shows that in 1424, in Europe, that is, northern Europe and Great Britain, the trees were in leaf in March, and the vines in April. In 1538 the gardens were flowering in January, and in 1585 the grain was in ear at Easter. In 1669 no frost or snow was experienced; in 1692 in Germany fires were not needed. Lastly the mildness of the winters of 1707 and 1832 is cited in the meteorological annals, and 1866 showed similar conditions. So even this much talked-of mild winter is an old chestnut, after all.

EVIDENTLY our Kansas City cotemporary begins to understand the character of the men who are managing the Millers' National Association. A glance at the proposed new constitution of that body has convinced our friend that, after all, the association is not moving in the right direction. Keep an eye on the "National," Brother Hall! All that has been said in criticism of that body has been and now is more than justified by facts. Every thing that has been said in commendation of it has been inspired by interest or ignorance. The Minneapolis element proposes to run the whole concern as an exporters' association. Men, as millers, are not to count in its councils. Barrels of flour are to serve instead of men when voting is to be done. Capacity is to take the place of the wisdom which might be derived from the counseling of many millers. It is a ludicrous idea that underlies the remarkable Minneapolis constitution which is to be jammed down the throat of the "National" at the next annual convention. It is possible that the new constitution may be too much for the constitution of the shriveled old "National."

DISPUTED AND DEMONSTRATED POINTS.

J. MURRAY CASE.

IV.

In my last article I dwelt exclusively upon the "first break," or wheat-splitting machine, as I regard that operation as strictly belonging to the wheat-cleaning in all cases where more than four breaks are used. The only object of a successive number of breaks is to produce as large a quantity as possible of semolina and middlings, whereby the separation of bran and germ may be effected before the flour-producing part of the berry is reduced to flour. By this means we obtain a flour substantially free from the coloring matter produced by fine particles of bran and germ. It is therefore apparent that the first object to be attained is so to reduce the wheat as to produce the greatest quantity possible of this semolina and middlings and of the best quality to be operated upon by the process of purification. All efforts to produce a large quantity of flour by the breaks, and thus reduce the labor to be performed by the smooth roll reductions, I regard as a movement in the wrong direction, although it has been supported by some vigorous advocates in America. It can not be denied that white flour can be made on the soft-break system, and that 60 per cent. of the flour may be made in the wheat breaks, using fine corrugations and rounded teeth; but flour thus produced is always lacking in that essential quality, sharpness of granulation, and for merchant milling it has been clearly proved to be a failure.

In the earlier history of roller milling three and four break mills were erected. The profitable operation of these mills stimulated the miller to grind more than the legitimate capacity of the rolls, and the results were not so good. This led to the addition of another break, instead of doubling the roll surface on existing breaks; and as the output was increased still another break was added, and then another, until by a sort of common consent the milling engineers got into the habit of using six breaks, and did not know why they used that number, only that Jones and Smith had six breaks in their mills. As a result of this mutual consent all the small millers were led to believe that six breaks were essential, absolutely necessary for successful milling; and consequently for a number of years scarcely any small mills, either in America or Europe, changed to rolls. The system was so elaborate in all its details that small mills could not afford the outlay, and in time (especially is this the case in the States) they became unprofitable, and many were comparatively idle, and those which did run generally did so at a loss.

This stimulated the American engineers to undertake to provide a system for small mills less elaborate, but which would enable them to compete with the larger mills and thus hold their local trade. In doing this they reduced the number of breaks to three and eliminated much of the paraphernalia commonly used in larger mills. These small mills, thus built, proved successful and in many cases produced results superior to some of the larger ones. Then arose the dispute between the advocates of the "short-break system" and the "long-break system," which has deluged the American milling journals for the last four years and has only been answered by the stern fact that the short-break mills, built with special reference to making a large percentage of middlings, have been the most successful; and that instead of the large long-break system mills running out the little "shorties," as it was prophesied, it has become a serious question as to whether or not the little mills will not ultimately supply all local demands, and thus make the large ones unprofitable.

So I may say that it is clearly demonstrated that a short-break mill is a success, and the question presents itself as to how short they should be. I may answer this question in one sentence, they should never be so short as to injure the quality or reduce the quantity of middlings and semolina, and never so long as to produce an unnecessary quantity of bran-powder. If too short, the quality of the middlings is injured; if too long, the flour is darkened in color. These two important facts are based upon well-grounded reasons. To shorten the system so much that the middlings removed

from the bran can not find sufficient space in the corrugation to hide away, so to speak, they must, in that case, be crushed, softened and injured, and consequently not in suitable condition for perfect purification. If too long, there is an unnecessary amount of abrasion of the bran, and between these two extremes we must look for the true system.

In six-break mills we not infrequently find that the miller simply splits the wheat on the first-break, mangles it somewhat on the second, and only produces a trifling quantity of middlings on the third. The flour, therefore, from the first, second and third breaks is of a very dark color. On the fourth-break he performs a good deal of work, a work that might better have been done on the first operation and thus saved the production of so much very dark flour, made dark by the sharp corrugations scraping upon the whole and half grains of the wheat. It is hard for some millers to comprehend that this bran-powder is a production of the rolls and not an element that exists in the wheat; and that, as many will say, "if I don't get it out that way it will get into the flour in the next breaks." The facts are, you are producing it, and the harder and less broken the wheat berry, the more you will produce, because in that condition there is no yielding action, and consequently the corrugations scrape hard upon the bran coating. It is therefore important that in the first operation after the "splitter," if used, all the work should be done that it is possible to do, and at the same time preserve the quantity and quality of the middlings. This may be set down as a fundamental rule applicable to every kind and quality of wheat, because it is based upon absolutely correct principles.

Following out this rule, the question arises, How much work can be done on this first main break without damage to the material? This will depend upon two conditions: first, the quality of wheat used; second, the style of corrugation employed. Assuming a six-break mill as a standard of comparison, I would say that with suitable corrugations the wheat should be broken on this first main break, when soft wheat is used, down to the ordinary fourth-break. This leaves the two or three succeeding breaks to perform precisely the same function that they perform in a six-break mill, but you will have the decided advantage that the average break-flour will be of a better color and worth more money. The bran will also be broader, and less "bran chips" or cuttings to contend with on the smooth rolls, and consequently a more perfect finish and increased yield.

After my experience in programming and erecting a very large number of mills operating upon all kinds of wheat and conditions of climate, I am fully persuaded that four breaks for the very soft wheats and three breaks for the hard varieties are the correct number for the most successful milling. In this I do not count the "wheat-splitter," which, when used, can only be regarded as a wheat-cleaner. In the use of the standard corrugations I have found on a four-break mill that 12, 16, 20 and 24 are the suitable numbers. The first-break should run back to back and the tooth be made as deep as possible. The other three may be front-cut. In a three-break mill the cuts would be the same, simply skipping the 16.

I have found, however, that in either a three or four break mill, where a large amount of work is to be done on the first main break, that a "special corrugation" may be used on the first-break to advantage, a corrugation of my own design, which is provided with alternate teeth and blank smooth spaces in the slow roll. These blank spaces form recesses to hold the middlings, and consequently but a small amount of flour is made and a broader bran insured. I do not offer any suggestions as to the number or kind of corrugations to be used in a six-break mill, for I am persuaded that the time has passed when six-break mills will be built, except in cases where men are governed by the precedent of old usage rather than by reason and investigation; and they will always find milling engineers ready to furnish them with all the useless paraphernalia that their perverted fancy may demand.

In relation to the spiral used on corrugated rolls, few can tell the reason why they are used or what function they per-

form, and consequently they are often made so as to produce more injury than good. In my own mind I am fully persuaded that they do no good whatever, except to prevent the points of the teeth coming in contact with each other, and one half-inch spiral in the length of a roll would perform this as well as six inches. An excessive spiral, when made so that they cross each other at the point of contact, thus forming a shear's action, will do more injury than good. The line of one is upon an angle of elevation, that of the other an angle of depression, precisely like the crossing of shears; the result is that the wheat-berry is caused to slide endwise of the roll, towards one end only, and in this sliding action there is a tendency to shave off long splinters of bran upon which clings a quantity of middlings. These "splinters" pass the meshes of the scalpers and find their way to the germ-rolls, where they are crushed, but not one-half the flour is removed from them, and they go to the pollard rich with flour, thus helping to drag down the yield. Sometimes these "bran-chips" are sent to the fifth-break, where they are chopped up so that they will nearly all pass the scalper and thus get intermingled with the middlings, when a part of them go to the rolls for making patent flour, and a part to the germ-rolls, when they ultimately appear in a flour of a muddy color and reduced value.—London "*Millers' Gazette*."

THEY BIT OFF THEIR OWN NOSES.

Even the farmers in the Western States are getting their eyes opened to the results of their own meddling with the business of the railroad companies. They have succeeded in getting laws passed that forbid the railroads to make distinctions between long and short haul rates, and between large shippers and small shippers. The farmers in the corn-growing States have this season an enormous surplus of corn on hand, which, they assert, is "valueless at present prices, inasmuch as the cost of getting it to market absorbs so much of the proceeds that they have not enough left to pay them for the labor of raising it." Now these same farmers, who have so unwarrantably meddled with the business of the railroads and forced them to raise their "through rates," are actually petitioning the law-tied roads to make "an emergency rate for the transportation of corn to the Eastern markets"! In other words, they ask the roads to ignore the laws for the benefit of the purblind producers who created those laws. It is an instance of quick retribution well deserved. If there were no fool Interstate Commerce law in existence, the roads would now be competing for cargoes of corn in Kansas, Iowa and Nebraska, and that competition would reduce freight rates between those States and the Atlantic seaboard as they can never be cheapened so long as the fool Interstate Commerce law remains in existence. The Kansas, Nebraska and Iowa farmers are learning a needed lesson, at great cost to themselves, of the true relations between themselves and their powerful and necessary friends and aids, the railroads. We expect to hear the strongest appeals for the repeal of the fool Interstate Commerce law from the very men who were most earnest and frantic in creating it. The railroads have been seriously crippled by the law, and, now that the creators of that law begin to be crippled by it, there is a prospect that justice will be done, even to the soulless, conscienceless railroad corporations that were foolishly willing to carry western produce so cheaply that the western producers passed laws to force them to put up their rates so that they should not lose on their operations! This is a fool world in some respects, and some western fools are evidently forced to acknowledge the corn!

LARGE WHEAT AREAS IN MONTANA.

According to a Montana correspondent, there is a good deal of fine wheat country yet unoccupied in Montana. He writes: "It is a significant fact that the acreage devoted to wheat in the United States has failed to keep pace with the increase of population, at the same time that the average yield per acre has fallen off. New York, Ohio, Illinois and the states west of the Mississippi have successively been regarded as wheat-producing centers and have all fallen off.

Illinois, which was once supposed to be the granary of the continent, has for several years produced less than enough to supply her own consumption. But while the area and supply of winter wheat have been decreasing, the newly-opened regions of the Northwest bid fair to produce an abundant supply of the now famous 'No. 1 hard' spring, the best wheat for bread-making in the world. The great reservation in Northern Montana, which was opened to settlement last year, will add greatly to the available wheat area of the country. Its area is equal to that of the three states of New York, Vermont and Massachusetts, and nearly all of it is arable land. It is a plateau 1,900 feet above the ocean level at its eastern extremity, rising gradually to 3,000 feet above at Great Falls, near its western. This plateau is fanned by the warm Chinook winds from the warm currents of the Pacific, bringing moisture in summer and tempering the severity of winter. The Milk River valley, which extends about 200 miles through the region, was the favorite feeding ground for the countless herds of buffalo whose bones whitened the ground when the reservation was first opened, but are now being gathered up at the rate of 100 tons a day and shipped eastward. In every part of this region where wheat has been sown a large yield has been secured. The seed is sown in February, as soon as the Chinook winds have thawed out the surface. It is ready for the harvest during the latter part of July, yielding from 25 to 40 bushels per acre. Millions of acres lie open for homestead entry, and it does not require any very vivid imagination to see in the near future the entire Milk River valley waving with yellow harvest fields."

WHERE THE BARLEY GROWS.

In a report upon the cultivation of barley, prepared by M. Tisserand, Director of Agriculture in France, it is estimated that the world's annual production of this grain is 825,000,000 bushels, of which three-fourths are grown in Europe, and the remainder in the United States, Canada, Chili, India, Australia, Japan, Tunis and Algeria. The total value is estimated at about \$800,000,000. The countries of largest production are stated as follows: Russia 129,000,000, the United Kingdom 93,000,000, Germany 93,000,000, Austria-Hungary 88,000,000, Spain 77,000,000, France 49,000,000, Sweden and Norway 22,000,000 bushels; out of Europe, Algeria 60,000,-000, Egypt 27,000,000 bushels.

HOW THE INTERSTATE COMMERCE LAW WORKS.

Recently the farmers of Piatt county, Illinois, held a convention to discuss the shipping question. The railroads and the railroad laws of course were the topics of interest. One of the speakers, S. W. Allerton, of Chicago, in an address to the farmers, hit the center in the following convincing utterance: "The Interstate Commerce law is in conflict with natural law and has added a large burden to the farmers of the Northwest. The present rate on corn from Chicago to New York is 25 cents per 100 pounds. A prominent railroad man said to me last week that they could haul corn to the seaboard at 12½ cents per 100 pounds and make money, but they could not do it on account of the Interstate Commerce law, for to do so would destroy all their local business, as it cost double to pick up the freight at local stations. The long-haul low rate has made the Western country. The Interstate Commerce law does not give the local shipper any less rate, but, when his product reaches a great terminal point, he receives no benefit of the low through rate. To give you a clearer idea of my view of the long and short haul, it costs just as much to get oats and corn from Monticello or Iowa to Chicago as before the passage of the law; but when our corn reaches this great terminal point, where it can be moved in solid trains, and if railroads were allowed to do business on business principles, the corn could be shipped to the seaboard at 12½ cents per hundred. The farmers of Piatt county and Iowa would then receive 12½ cents less rate, or 7 cents more for their corn. The law was passed under the pretext of stopping discrimination. What is the result? It discriminates against the public, in favor of the few. The

farmer, or small shipper, who does not own cars, so that he can receive mileage, can get no rebate; but the man with 1,000 cars can get a drawback as large as the railroad is pleased to give. Congress has been growling about the dressed beef shippers; but the Congress made the law that has made them, and five or six men control this vast cattle industry, largely by acts of Congress. A direct tax has been put on all our cattle, with an overflowing Treasury. The value of our cattle has been reduced by the acts of Congress full \$1 per hundred. It sometimes takes a great calamity before the people demand their rights. I think the time has come when the farmers of the Northwest should realize the importance of immediate action in regard to organization for the repeal of the Interstate Commerce law and all other laws which are detrimental to their interests."

Utterances like that show one evil effect. Other evil effects are seen on every hand. Recent Canadian dispatches speak of a great glut of freights on the Canadian roads, caused by big shipments of corn from Nebraska over the "Soo" route through Canada, to be delivered at Boston and other points in New England. This corn, in reaching its destination, is hauled twice as far over our own railways, at local rates, as over the Canadian railways; but the full rate through Canada is from 3 to 10 cents per 100 pounds cheaper than the rate of the trunk lines. The trunk lines can not lower their "short haul" rates to meet Canadian competition. They are forced to depend upon their local trade instead of cheapening the rates for through traffic to meet the requirements of the Interstate Commerce Act. So Boston gets the corn, and the Canadian roads get the traffic. It has been reported that there is a blockade of 10,000 loaded cars awaiting movement. What American interest is served by this state of things, growing out of this fool law?

FLOUR MILLS AND INSURANCE.

Writing on the subject of flour-mills and their hazards in a New York paper, I. S. Montgomery says: "First, is the foundation of building solid? Is all the mill-wright work strong and substantial? Is the shafting sufficiently large for the work it has to perform? Is it well hung and arranged? Is it running smooth and in line? Are the bearings all metal; are they well set and running cool; are they provided with drip-cups? If there are any wooden bearings, how many revolutions does the shaft make per minute? Are all pillar-blocks solid and substantial? Is any part of the shafting overloaded, any bad couplings or pulleys out of balance? To be able to discover defects in these things is what an inspector should try to learn, for it is all important that he should be able truthfully and understandingly to answer the question in proper manner.

"Blow-rooms should be placed outside, and machines should discharge into them through metal spouts, or if they must be inside, they should be made fire-proof and ventilated to the outside, and all blow-pipes should be metal. Smut-dust is a dangerous agent when it becomes wet or damp. Again, there is a hazard in these blow-rooms. Some hard, foreign substance passes through a cleaning-machine; it strikes fire, and the spark is blown through discharge spout into the blow-room, and fire follows. We find usually in flour-mills grain-separators, grain-scourers or brush machines, smutters and screens; some of these machines are horizontal and some are vertical.

"First—How are these machines driven? Are they driven from top or bottom? If from top is there a bearing above the pulley, or is the pulley on the end of a shaft? It is important to know this, for it is dangerous to operate any machine in the latter way, as the strain is all on a wind and causes friction which may result in hot bearings and a fire. Next—Are there any concealed bearings, and, if so, how are they cared for? Are they kept clean and well oiled? Most of the new cleaning machinery is now set up with outside bearings, and a good many of the old machines are changed over to do the same. Examine carefully in all vertical machines to see if the step in which the toe of the shaft sets is cool. Elevator-boots next claim our attention. Here we ask: Are they easily accessible for cleaning? Are the

slides loose so they can be easily pulled out, and the bottom of the boot cleaned? Are the boots cleaned regularly? Are the accumulations allowed to remain there and become hardened, and likely to cause friction by the belts, or elevator buckets, or cups rubbing against them? Know that these places are cleaned regularly and well. Conveyors—See that the conveyors are running free: see whether or not there is a loose lid that will shove off, in case the conveyor begins to choke up. This should be insisted on if such conveyor boxes are closed, and practical mill-men nearly always have them so arranged.

"We now pass to the first floor. This is most always the grinding floor, and we find here the hopper-scales, flour-packers, some flour-bins and the grinding-machines, consisting of buhrs or rolls, or both. On this floor there is most generally good care and a number of operators, so that what hazard there is is most always neutralized by watchfulness. We inquire to see what ventilation there is for rolls and buhrs. Is there any patent exhaust to take dust and hot air from such rolls or buhrs? This is most commonly done by a fan sucking hot air and dust to a dust-room, or by dust collecting on some one of the upper floors. This is considered an important point and should be insisted on, as it keeps the floor free from dust and materially decreases the hazard.

"We now pass on to the second and third floors, where new classes of machinery are found, bolting machinery, called bolting-chests. It is important to know that these chests are well and safely arranged. Are these conveyors running free? Are they so arranged that they will at once indicate choking or clogging? That we have fires from choking in tight conveyor boxes in bolting-chests in flour-mills can not be disputed. Purifiers and aspirators next claim our attention. Here let me say that the aspirator has about disappeared from modern mills. Are the purifiers well arranged? Are they running well and steady? Are they speeded up too high? Is there plenty of space around them so they can be readily oiled and cared for? Are they dusting into dust-rooms, or have they individual dust-catchers, or dust-catchers grouped for them on any particular floor, or do they dust into the mill? The dust-room is bad, but dusting into the mill should, under the circumstances, never be allowed. By far the most satisfactory method of getting rid of dust is the use of a good dust-collector well arranged in the mill. Bran-dusters are machines to be looked after. Are they vertical or horizontal machines? Are they in order and running well? Examine them closely. Dust-houses have been spoken of somewhat in dealing with the question of cleaning machinery and purifiers. Some dust-houses are made of canvas, some of frame, and both are bad; the only good thing to be said of them is that they confine the dust to one part of the mill.

I repeat, the only proper method of getting rid of dust from rolls, buhrs and purifiers is the dust-collector. I should prefer the outside blow-room for grain-cleaning machines, and would require metal blow-pipes to such blow-rooms. No machine should be allowed to dust on to the roof of mill. On these upper floors again is found the conveyor. Look into this and see how it is arranged. Upper-line and counter shafting should be looked after in the same manner and with the same caution as in all other places. Elevator-heads next claim our attention, and here more care is required than in the examination of elevator-boots.

"Elevator-heads in the modern mill are constructed in three ways. The old method was, and is, a square strut-board under the upper pulley, and on this square board the dust and debris collect, and, in case of sweating grain or dampness from any other cause, this debris becomes hardened into a sort of punk-like substance, and friction from belts or pulley sets such substance on fire, and the mill is likely to be destroyed. Square strut-boards should not be allowed. The next style is to hopper them one way, so that all dust and debris will drop down the back leg. The third and last, as well as best, is to hopper them both ways; the last leaves no possible place for dust to lodge. Here also we try to discover if there has been any settling or sagging, so

that the shaft has worn down into the wood-work of the elevator-head and causes friction there; also from the settling of the pulley on the strut-board; also try to find out whether or not belts are running free and clear.

"Is the machinery so located on the different floors of the mill that a free passage can be had around and through it, so that such machinery can be easily and readily cared for, oiled and kept clean, or is it crowded and huddled together so as to obstruct passage way and render oiling and cleaning difficult, and in some instances dangerous, or is some of it in dark, close attics, or low, cramped up basements? In this latter case I should decline to write lines on the mill for reasons that should be obvious to all insurance men. Is machinery speeded up or worked beyond its capacity, or is it allowed to become old, and worn-out and shaky? Are all fan-bearings kept clean and well oiled? As they are liable to become gummed up with flour-dust. Is the mill kept strictly clean and neat? Are all old and worn-out, or otherwise useless machines, taken out, or are they left in the mill as catchalls for dust and other things that might cause trouble and obstruct a free passage?

"Badly crowded, dirty and slovenly kept mills, that are crowded up and allowed to become shaky, when order and care are at a discount, should not be written in any company. So, to repeat somewhat, the essentials of a good flour-mill are: First—Absolute cleanliness and order in all things, even to the smallest particular. Second—Good room on all floors, with solid and substantial mill-wright work; with good brick boiler-house detached, or cut off by good fire-doors and brick stack. Third—Good machinery, well located and cared for. Fourth—An abundant supply of casks of salt water and metal fire-pails on each floor of mill. Fifth—Good practical miller to operate mill. Sixth—Watchman with good watch-clock. Seventh—Know that mill is making money. Eight—Have the mill so constructed that there is plenty of day-light in all parts of it, so that dust and dirt can be seen; no dark basements; no blind attics, hollow walls, or concealed spaces. With the above essentials, I see no reason why a flour-mill should be considered one whit more hazardous than many specials which are written at about one-half the rate they are."

SOMETHING ABOUT HEAVEN AND HELL.

Following is an interesting computation by George A. Shufeldt, of New York, N. Y., which appeared in the New York "Sun." Computing the "population of hell," he says: "In round numbers the earth has a population of 1,300,000,000, of whom 300,000,000 are professed Christians, the other 1,000,000,000 being Mohammedans, Buddhists, Jews, pagans and heathen. The whole race was condemned to eternal punishment for the sin of Adam. This was the fall of man, from which there was and is no redemption save through the death of Christ. Biblical chronology gives the earth a period of about 6,000 years. From Adam's time to Christ was 4,000 years, during which period no human souls were saved. The population may then have averaged 1,000,000,000. Three generations, or 3,000,000,000, pass away in each century. Forty centuries, therefore, consigned 120,000,000,000 of men to eternal fire, and for all we know, they are there now. In the 1,900 years which have elapsed since the birth of Christ 57,000,000,000 more of human beings have lived and died. If all the Christians, nominal and real, who have ever lived on the face of the earth have been saved, they would not number more than 18,000,000,000. Now, if we deduct this latter number from the grand total of 177,000,000,000, we find 159,000,000,000 of souls who are suffering the torments of hell fire, as against the 18,000,000,000 who have escaped. But this is not the whole truth. Nobody believes that more than ten per cent. of the professed Christians are saved. Calvinists themselves say that the elect are few. If this is a fact heaven contains but 1,800,000,000, against a population in hell of 175,000,000,000.

Another correspondent, F. L. Wall, in the "Sun" computes the capacity of heaven as follows: "And he measured the city with the reed, 12,000 furlongs. The length and the breadth and the height of it are equal."—Rev. xxi, 16.

Twelve thousand furlongs, 7,920,000, feet, which, being cubed, is 496,793,088,000,000,000 cubic feet. Reserving half of this space for the throne and court of heaven, and half the balance for streets, we have the remainder of 124,198,272,-000,000,000 cubic feet. Divide this by 4,096, the cubical feet in a room sixteen feet square, and there will be 30,321,-843,750,000,000 rooms. We will now suppose the world always did and always will contain 990,000,000 inhabitants, and that a generation lasts 33½ years, making in all 2,970,-000,000 every century; and that the world will stand 100,-000,000 years, or 1,000 centuries, making in all 2,970,000,000,-000 inhabitants. Then suppose there were 100 worlds equal to this in number of inhabitants and duration of years, making a total of 297,000,000,000,000 of persons, and there would be more than a hundred rooms, 16 feet square, for each person.

The most fantastic hell is that of the Chinamen. The sixth court of the Chinese hell is situated at the bottom of the great ocean, north of Wuchio Rock. It is a vast, noisy gehenna, many leagues in extent, and around it are 16 wards or ante-hells. In the first ward the sinful soul is made to kneel for long periods on hot iron shots; in the second they are placed up to their necks in filth; in the third they are pounded till the blood runs out; in the fourth their mouths are opened with red-hot pincers and filled with needles; in the fifth they are inclosed in a net of thorns and nipped by poisonous locusts; in the seventh all the flesh and bones are crushed to a jelly, except the head; in the eighth the head is denuded of skin and the flesh is beaten on the raw; in the ninth the mouth is filled with fire; in the tenth the pounded flesh on the body is licked and roasted by sulphurous flames; in the eleventh the nostrils are subjected to all loathsome smells known to their tormentors; in the twelfth they are to be butted by rams, oxen and buffalos, and at last subjected to crushing pressure by being trampled by horses; in the thirteenth the heart will be taken out and skinned; in the fourteenth the skull will be rubbed with sandstone until it has been entirely worn from the jelly like mass which was once the body; in the fifteenth the body will be separated in the middle and carried, with the bare, bleeding ends sitting on red hot plates, to the sixteenth ward where the skin will be removed, dried and rolled up, after having written upon it all the sinful deeds done by the soul while an inhabitant of the fleshy body; after that the body will be consigned to the flames.

CATARRH.

CATARRHAL DEAFNESS—HAY FEVER.

A NEW HOME TREATMENT.

Sufferers are not generally aware that these diseases are contagious, or that they are due to the presence of living parasites in the lining membrane of the nose and eustachian tubes. Microscopic research, however, has proved this to be a fact, and the result of this discovery is that a simple remedy has been formulated whereby catarrh, catarrhal deafness and hay fever are permanently cured in from one to three simple applications made at home by the patient once in two weeks.

N. B.—This treatment is not a snuff or an ointment; both have been discarded by reputable physicians as injurious. A pamphlet explaining this new treatment is sent free on receipt of stamp to pay postage, by A. H. Dixon & Son, 337 and 339 West King street, Toronto, Canada.—*Christian Advocate*.

Sufferers from Catarrhal troubles should carefully read the above.

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GENERAL NOTES.

THERE are in Florida about 10,000 orange growers. The acreage is 100,000, and the capital invested is from \$60,000,000 to \$75,000,000. Three seasons ago there were produced 1,250,000 boxes, two seasons ago 2,100,000, and last season about 2,500,000 boxes. It is estimated that the crop of 1890 will be over 4,000,000 boxes. This, of course, has had a marked effect on the orange trade of the United States, and its influence is shown in the steady decrease in foreign oranges brought to our markets. In 1887 there were imported 1,620,000 boxes and 127,000 cases of foreign oranges; in 1888 the total was 1,150,000 boxes and 154,000 cases; in 1889 it was 1,100,000 boxes and 180,000 cases.

POINTS IN MILLING.

THE completeness of the milling revolution in the United States is forcibly shown in facts like the following: A month ago I was in a flouring-mill in which 75 men and boys are employed. Something was said about buhr milling, and a canvass of the force showed that 25 of the men in that force knew absolutely nothing about buhr milling. This number of course included the boys and the younger men of the force. Of the remaining employes, 30 knew something of buhr work in a general way, but had never really made flour on buhrs. The other 20 men, the older ones in the force, had worked in buhr mills, but not one of them felt competent to take hold of a buhr plant and manage it. Of the whole number in the force there was not single man who could dress a buhr, or put it in standing and running balance, or do some other things that were required of the regular buhr millers in the good old time.

ANOTHER evidence of the completeness of the revolution is the generally improved quality of the bread used in the United States. Fine flour is to be had in every cross-roads store in the country, and the average American bread is superior to that of any other country. The demand for "nutty flavored" bread has gone to meet the preference for brown and rank flavored sugars, the color and flavor in both cases being due to the presence of dirt and impurity. Bread eaters and sugar eaters have discovered that pure flour and pure sugar are white, and that they are not pure unless they are white. This discovery in the case of wheat flour was brought about by the roller revolution.

Of course there is no such thing as crease-dirt. High authority says the so-called crease-dirt exists only in imagination, and that there is no trouble from crease-dirt when the wheat has been perfectly cleaned. At the same time, who ever saw a cleaning of wheat berries so perfect that the seam did not contain a suspicious dark substance? It is easy to believe that perfect cleaning would abolish crease-dirt, but it is not easy to believe that any mill in the world cleans, or can clean, wheat so perfectly that the seam would not retain some of the black impurities that are found in it when

uncleaned. Changing a name is an easy way to abolish a nuisance, but the nuisance refuses to be abolished in that easy way.

THE WORLD'S GOLD AND SILVER MONEY.

Herr Ottmar Haupt, an acknowledged authority on the production, present supply and consumption of gold and silver, has just issued his annual statement of the amount of precious metal in the great banks and treasuries of the world. His figures are as follows:

	Silver.	Gold.
Associated Banks of New York.....	\$	\$ 78,200,000
Other American banks.....	11,000,000	8,000,000
American (United States) Treasury.....	312,000,000	325,600,000
Bank of England.....	.....	89,000,000
Scottish banks of issue.....	.....	25,000,000
Irish banks of issue.....	.....	16,600,000
Other banks in Great Britain.....	.....	40,000,000
Bank of France.....	249,400,000	254,600,000
Italian note banks.....	6,600,000	33,600,000
Italian National Banks.....	6,200,000	35,600,000
Italian Government Treasure.....	2,400,000	20,600,000
Belgian National Bank.....	7,000,000	13,000,000
Swiss banks of issue.....	4,800,000	11,800,000
Grecian National Bank.....	.....	600,000
Bank of Spain.....	23,600,000	20,400,000
Bank of Algiers.....	3,200,000	3,400,000
Bank of Holland.....	30,400,000	25,600,000
Bank of Roumania.....	6,400,000	.....
Bank of Portugal.....	.....	5,600,000
Bank of Sweden	1,000,000	4,800,000
Swedish National Banks.....	4,800,000	11,800,000
Bank of Norway.....	.....	13,400,000
Bank of Denmark.....	.....	15,000,000
Bank of Russia.....	800,000	168,200,000
Russian Government Treasure.....	4,600,000	28,800,000
Austro-Hungarian Bank.....	68,000,000	27,000,000
German Imperial Bank.....	48,000,000	143,200,000
German note banks.....	1,000,000	19,000,000
German Government Treasure.....	.....	30,000,000
Totals.....	\$791,200,000	\$1,468,400,000

COTEMPORARY COMMENT.

It is not often that wheat is sold for elevator charges, but such a sale will undoubtedly occur in Milwaukee soon. A notice was recently posted on 'Change informing the public that Northwestern Marine Elevator receipt No. 8,019, dated Oct. 18, 1883, for 1,000 bushels of No. 2 wheat, had accrued storage charges sufficient to cover its market value, and that it would be canceled unless the charges were paid before Jan. 10, 1890. On the day the receipt was issued No. 2 wheat closed at 91 cents, and several times since it has been worth much more. The interest on the money invested and the insurance would make the cost of the wheat to the owner about \$2 a bushel.—Chicago "American Elevator."

The Secretary of the Millers' National Association was present at the meeting of the Nebraska Millers' State Association. Next day a dispatch appeared in an Omaha paper stating that the Nebraska Association had ten thousand members. Comment is unnecessary.—Chicago "American Miller."

C. C. Wolcott, the grain man, is reported to be at Bismarck in the interests of a French syndicate organized to deal in North Dakota wheat and flour. This syndicate's movements may create commotion among the English capitalists who have become owners of various elevators in the Northwest.—Minneapolis "Market Record."

If you were going into a powder-house wearing boots with flint heels, you would expect to die like a desperado, with those boots on, and more than likely you would be murmuring: "See that my grave's kept green." Now we want to suggest to you that when you go pudging about the mill filled with floating fiber dust, holding an open light in your hand, that you keep your thoughts on the plan of salvation for lost sinners.—St. Louis "Miller."

In a country like ours, with its 20,000 flour-mills, all such schemes are utterly impractical. The great law of supply and demand must and will continue to fix prices, in spite of all combinations. If the milling industry of the United States was in the hands of a few men, all under the control

of one head, like the Standard Oil business, the output of flour might be controlled for a time at least, but such a state of things would be unnatural if not unlawful, and the combination would not last. Nature alone holds in her hand the power to increase or diminish the amount of bread that

shall be thrown upon the market at any and all times.—*Modern "Miller."* And yet, esteemed cotemporary, you think the Millers' National Association a good concern, while its main work for the past two years has been in the direction which you declare to be "impractical."

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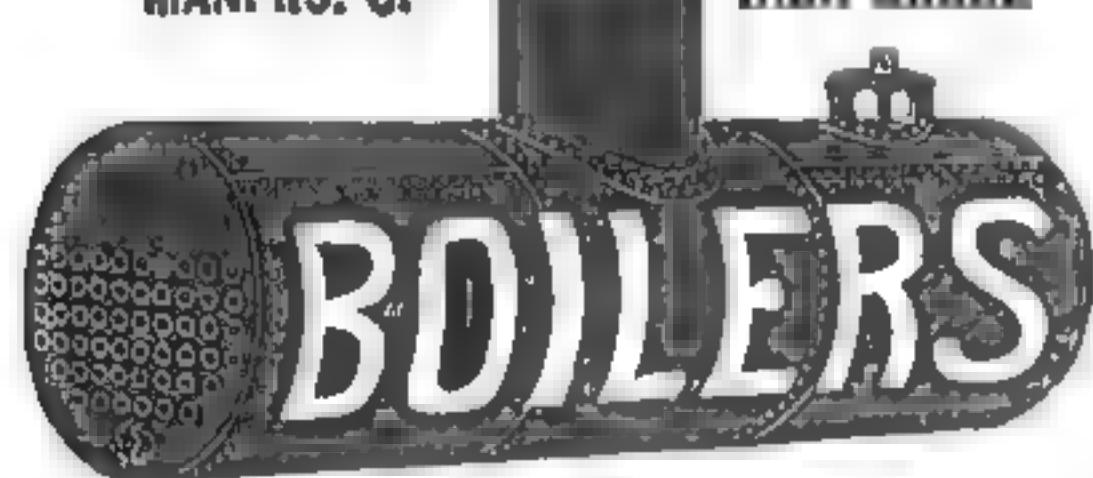
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Oil Tanks & Smoke Stacks,

HEAVY SHEET IRON WORK.

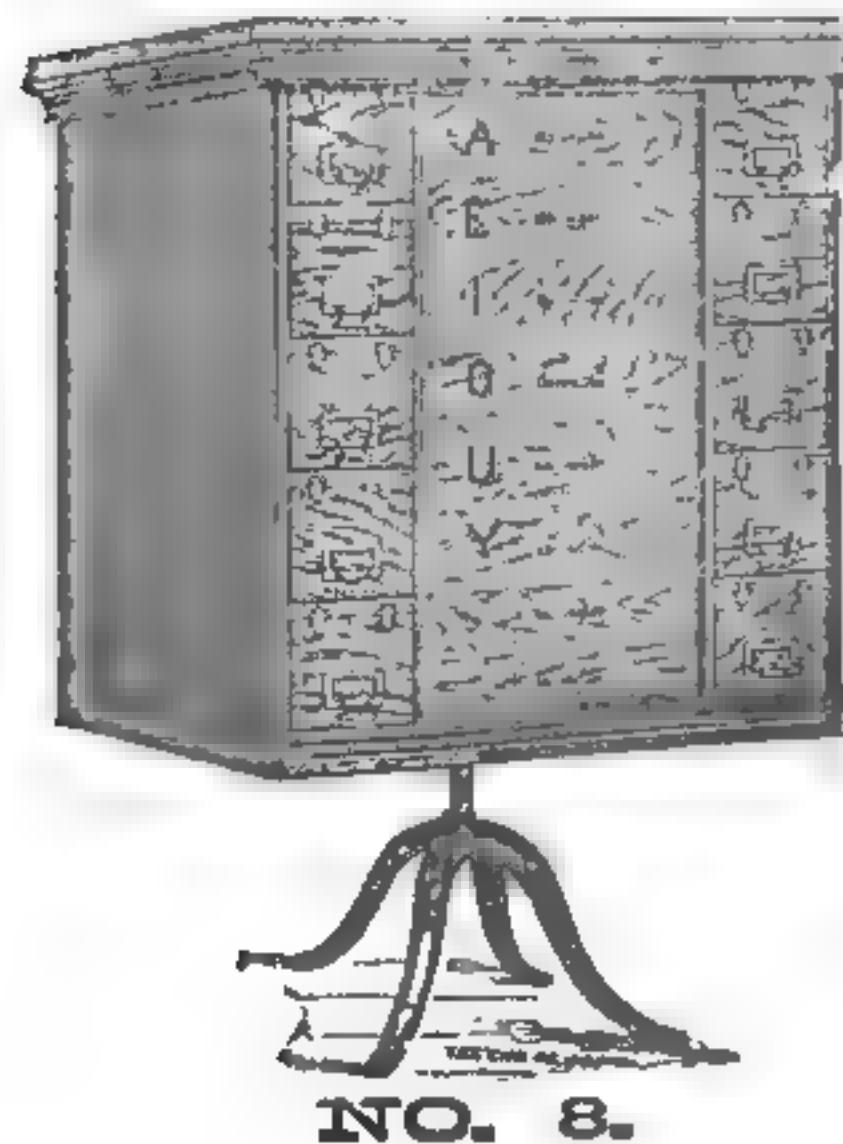
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Our Cabinet Files are Conceded to be the Most Convenient of Any in the Market. They are Compact, Simple, Complete, Durable and Ornamental.

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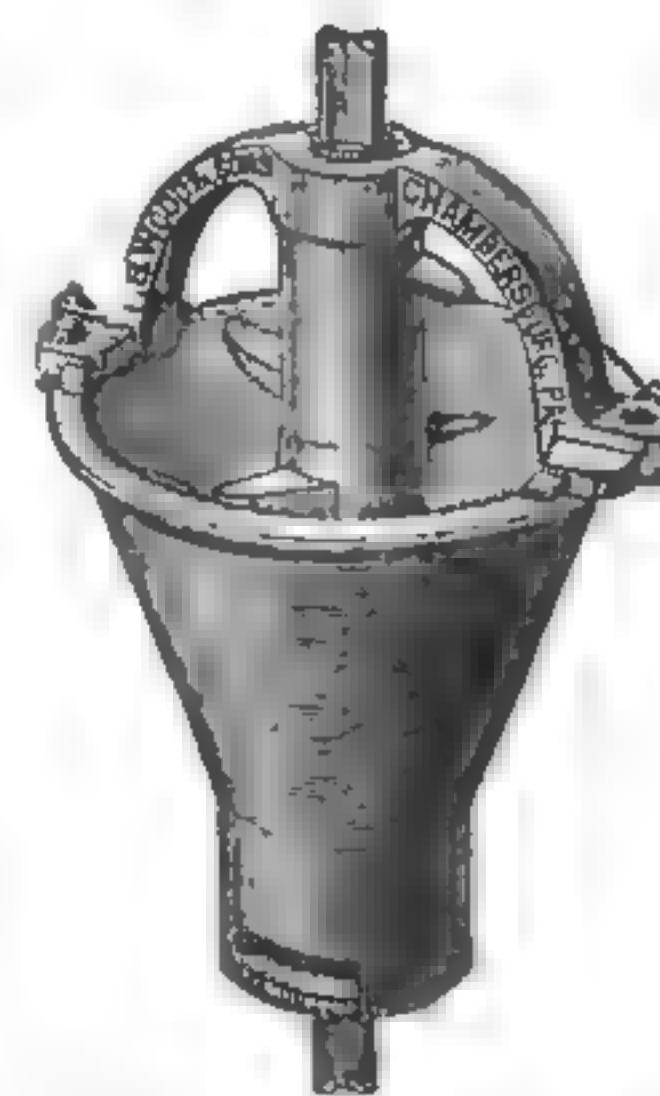
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All wearing parts cast of a steel mixture. Notice difference in construction. Most area where most work is done, where all other crushers have least area where most work is done. Low priced machinery is not the cheapest, considering durability and efficiency. Sent on 80 days' trial when satisfactory reference is furnished.

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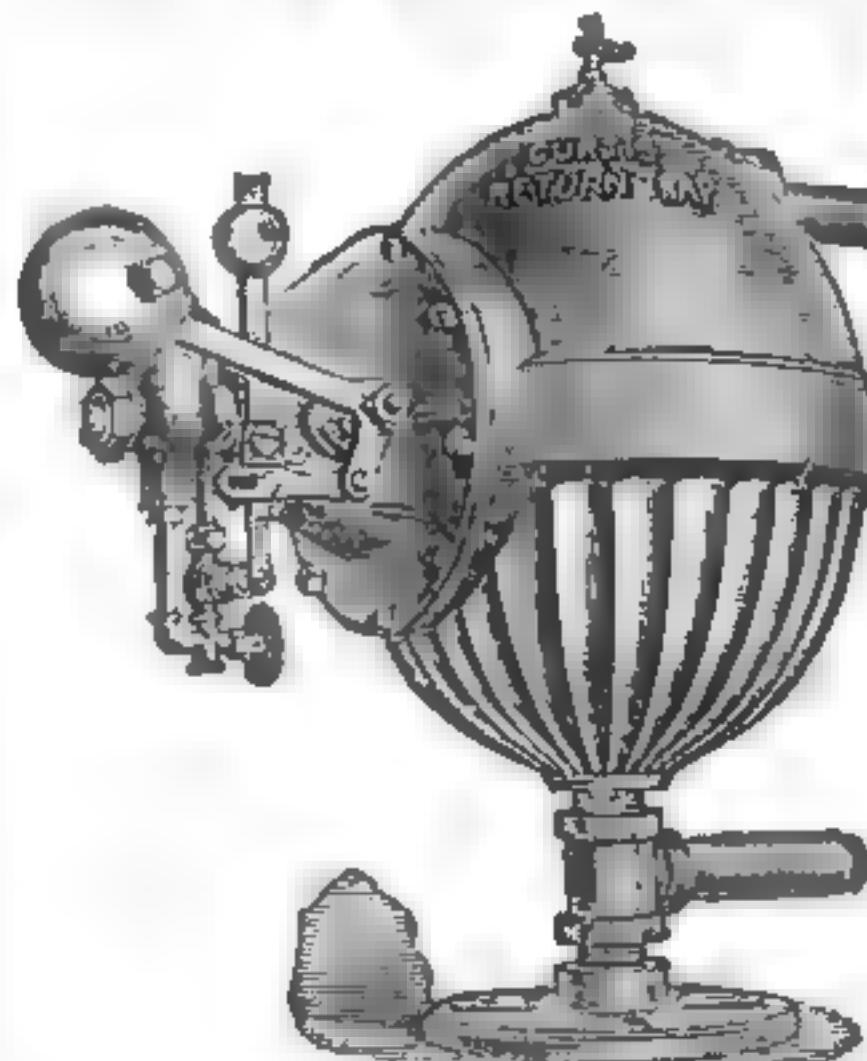
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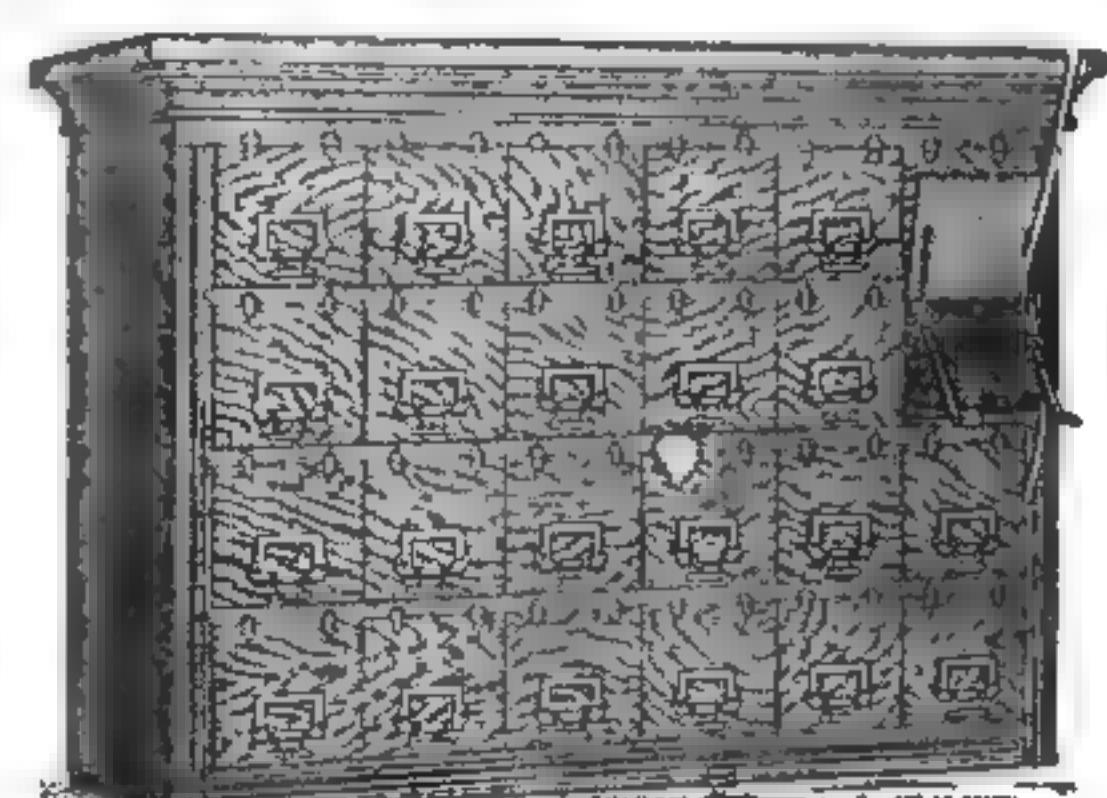
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It is noiseless, positive, rapid, will return all condensation back into the boiler, and works equally well in connection with reduced pressure or exhaust steam, also when the return is below the water line of the boiler.

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NO. 1.



J. B. Standley, miller, Colton, Wash., is dead.
A. L. Elbert, miller, Boyer's Ford, Pa., sheriffed.
Dennison & Co., millers, Oconto, Wis., quit business.
Wm. Vowles & Sons, millers, Toole, Utah, dissolved.
J. B. Swearinger, feed-mill, Des Moines, Ia., sold out.
Deaninger Bros., millers, Charlotte, Mich., sold to Perkins & Moon.
Louis Sands and others, Filertown, Mich., project a \$60,000 flouring mill.

Messrs. Barlow Bros., of Grand Rapids, Mich., report that they have recently closed a contract with the Chicago, Burlington & Quincy Railroad Co., conveying the right to manufacture Barlow's patent manifold shipping-blanks for use over the entire system of that great railway corporation, for which the Burlington folks pay a handsome royalty. The making of this contract is at once an evidence of the good judgment of the Railroad Company, the enterprise of Barlow Brothers and the great merit of the blanks they manufacture.

Says a New York journal: The dullness and depression that have existed in the flour trade for the past two months are without precedent in the memory of the oldest dealer. It extends not only through the export trade, with the single exception of the West India branch of it, but to the entire domestic trade of the United States as well as of Europe. It had been supposed that while stocks in first hands were larger than in any former year, with the exception of last, when they were the largest in the history of the trade, they were smaller in second hands than usual this year. Hence the firmness with which dealers and millers held their stocks through December in the belief that, after the new year came in, jobbers would have to buy freely to supply the local demand. The first month of the new year has come and gone, and, instead of the increased demand expected from the home trade as well as from Europe, both have been duller than in December. We have now entered the second month of the new year and the last of winter with no improvement. The maximum consumption is always counted upon with minimum prices, and minimum consumption has never been experienced until this year, both at home and abroad, when prices have been as low as they have this year and nearly as low as two years ago, when they were the lowest on record. A careful inquiry among the dealers here has resulted in the general answer that the grip and the mild winter together are the cause. Dealers and miller's agents, who supply the local dealers about New York and through the Eastern States, have been complaining for a month that they were unable to sell flour because their customers had plenty of stock on hand, bought in November and December, which they had been unable to sell. To emphasize this anomalous condition of the trade, our city mills are not only extending their facilities and enlarging their capacity, but Western millers have lately been here investigating the advantages of New York mills over those of the West by which they can command the West India and other export trade, with a view to building more mills here. One of the largest winter-wheat millers of Ohio recently came here for this avowed purpose and looked our city mills all through and Staten Island all over, but returned without doing anything more. Some time since, the largest miller in Chicago came here and, without saying much, looked the same ground all over, and went home to send on a representative here who has become a member of the Produce Exchange, but not for the sale of their flour. It is now reported on the Exchange as a fact that they have already secured a site on Staten Island and will build another mill there the coming year. The reason given for this is that the interstate law helps New York millers and gives them an advantage over the West which the West formerly had over New York by reason of the long and short haul clause in that law. While another new mill is thus counted on the coming year in addition to the Staten Island mill built last year, the old city mills have increased their capacity within a year nearly

1,000 barrels per day, making a total of 8,600 barrels. The Jewel Milling Company have not only made their mill of 1,500 barrels capacity, but they are building a fine new dock of two stories, with a storage capacity of 20,000, making the largest mill dock and warehouse in the city. Jones & Co. are building a 500-barrel addition to their mill, which will give them the largest mill in the city, with 2,500 barrels daily capacity. This will be completed late in the spring or early summer, when our total capacity will be 51,600 barrels weekly, or nearly 20,000 barrels more than it has been since Hecker dismantled one of his mills and the Atlantic Dock Mills were abandoned several years ago, when the business was overdone and unprofitable for the latest comers, who finally went out of it. The Western millers seem to misunderstand the cause of the great activity of the past year with the city mills, and to regard it as a permanent thing, when everybody here knows that it was chiefly due to the doubling up of the South American demand on account of the failure of the last year's wheat crop of the Southern half of the Western hemisphere. This has already fallen off with good wheat crops this year, and the city mills have been able to keep running and hold prices up, simply because they were sold ahead for the West Indies.

DEFEAT FOR THE "BIG FOUR."

Millers everywhere in the United States will be interested in the following dispatch from Chicago, dated February 15: "A decision has been rendered in the United States Court here by Judge Blodgett which concerns every miller in the country using the modern roller process of manufacturing flour. The use of rolls is very old, but many patents have been issued in the United States covering special features of construction and adjustment. Some time ago four of the leading manufacturers of roller mills formed the Consolidated Roller Mill Company, and pooled all their patents numbering over fifty. They then commenced suit against a number of millers and manufacturers. One of these suits was decided in their favor by Judge Brown of the Michigan Circuit Court, and another against them at Indianapolis by Judge Gresham. The patents on which the consolidated company principally relied were those of W. D. Gray, of Milwaukee, U. H. Odell and H. Birkholz. Judge Blodgett has now decided in a suit brought against the Barnard & Leas Manufacturing Company of Moline, Illinois, that those patents can only be sustained for such special devices as they cover, and that the inventors entered the field at so late a day they are not entitled to have the doctrine of equivalents enforced in their behalf. This decision relieves thousands of millers from the fear of suits for infringement."

The four firms comprising the Consolidated Roller Mill Company are: The John T. Noye Manufacturing Company, of Buffalo, N. Y.; E. P. Allis and Company, of Milwaukee; The Stilwell and Bierce Manufacturing Company, of Dayton, O., and The Nordyke and Marmon Company, of Indianapolis, Ind. There has been no reasonable doubt from the beginning that the Consolidated Roller Mill Company would fail in their attempts to corner the roll-manufacturing business in the United States.

A NEW METHOD OF TREATING DISEASE.

HOSPITAL REMEDIES.

What are they? There is a new departure in the treatment of disease. It consists in the collection of the specifics used by noted specialists of Europe and America, and bringing them within the reach of all. For instance the treatment pursued by special physicians who treat indigestion, stomach and liver troubles only, was obtained and prepared. The treatment of other physicians, celebrated for curing catarrh was procured, and so on till these incomparable cures now include disease of the lungs, kidneys, female weakness, rheumatism and nervous debility.

This new method of "one remedy for one disease" must appeal to the common sense of all sufferers, many of whom have experienced the ill effects, and thoroughly realize the absurdity of the claims of Patent Medicines which are guaranteed to cure every ill out of a single bottle, and the use of which, as statistics prove, has ruined more stomachs than alcohol. A circular describing these new remedies is sent free on receipt of stamp to pay postage by Hospital Remedy Company, Toronto, Canada, sole proprietors.



W.A.BINGHAM,
MANUFACTURER OF
FLOUR SACKS.

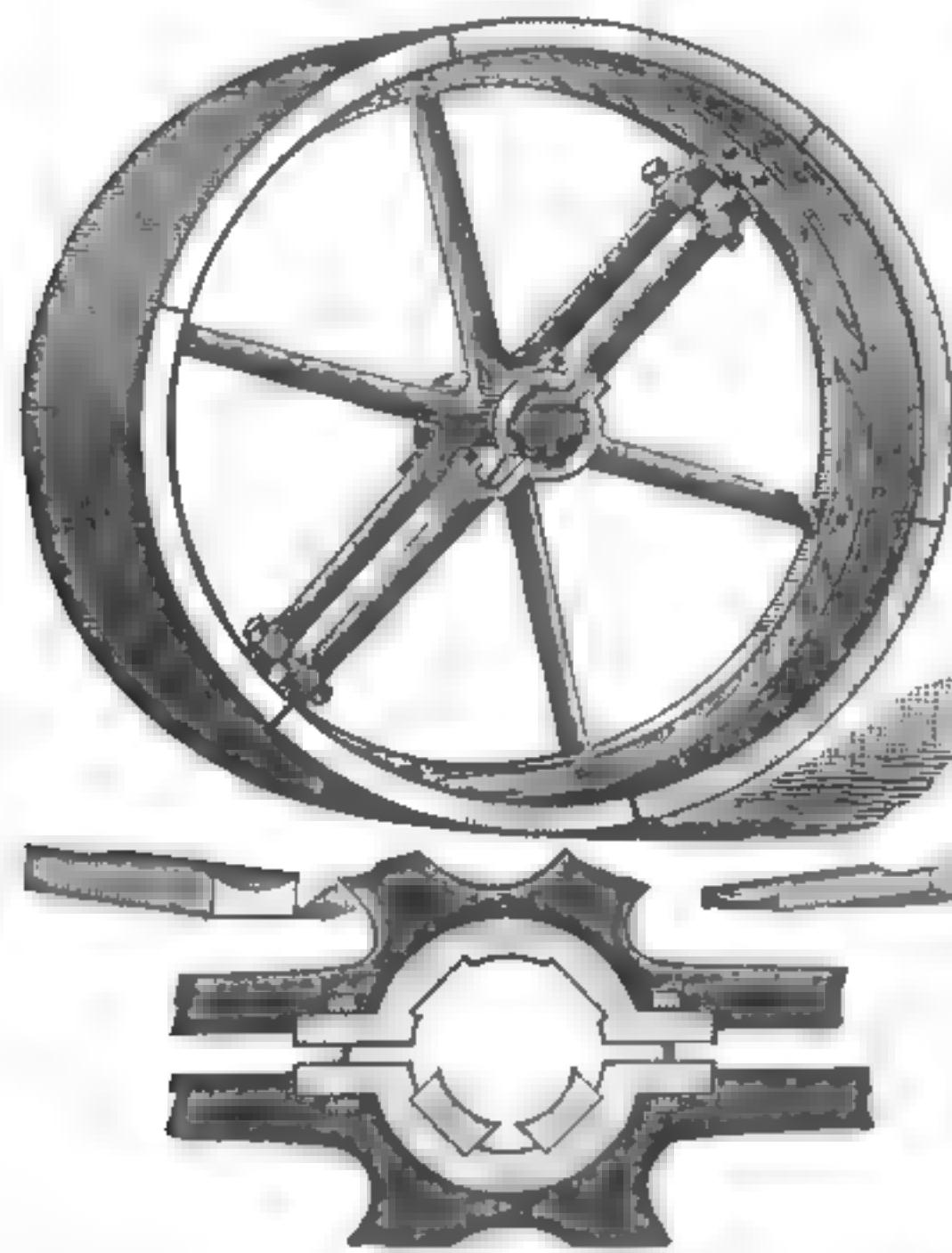
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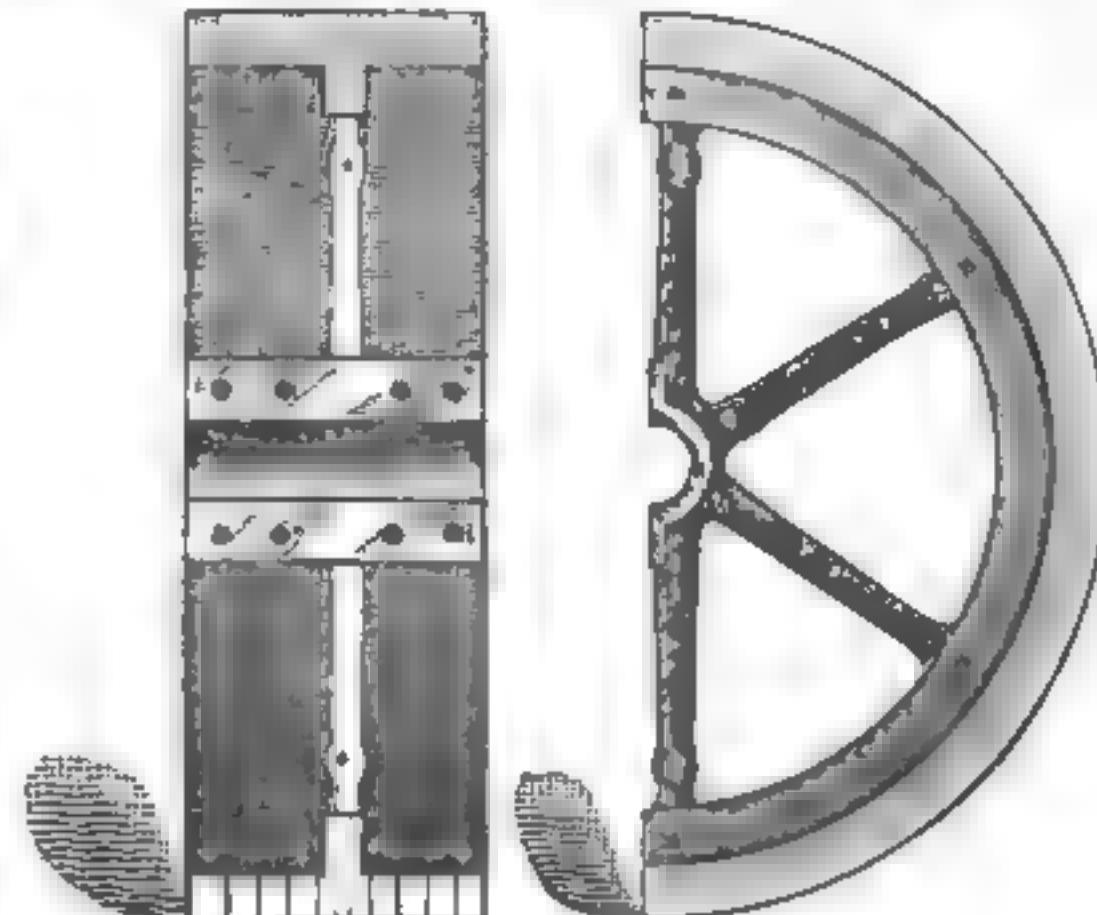
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The Best Pulley on Earth!

Is very easily and quickly adjusted to Shaft. Has Patent Iron Bushings Interchangeable, to Fit Different Diameters of Shafts. Has FOUR or SIX Bearings on Shaft. This fastening never slips. Every Pulley strongly built and perfectly balanced.



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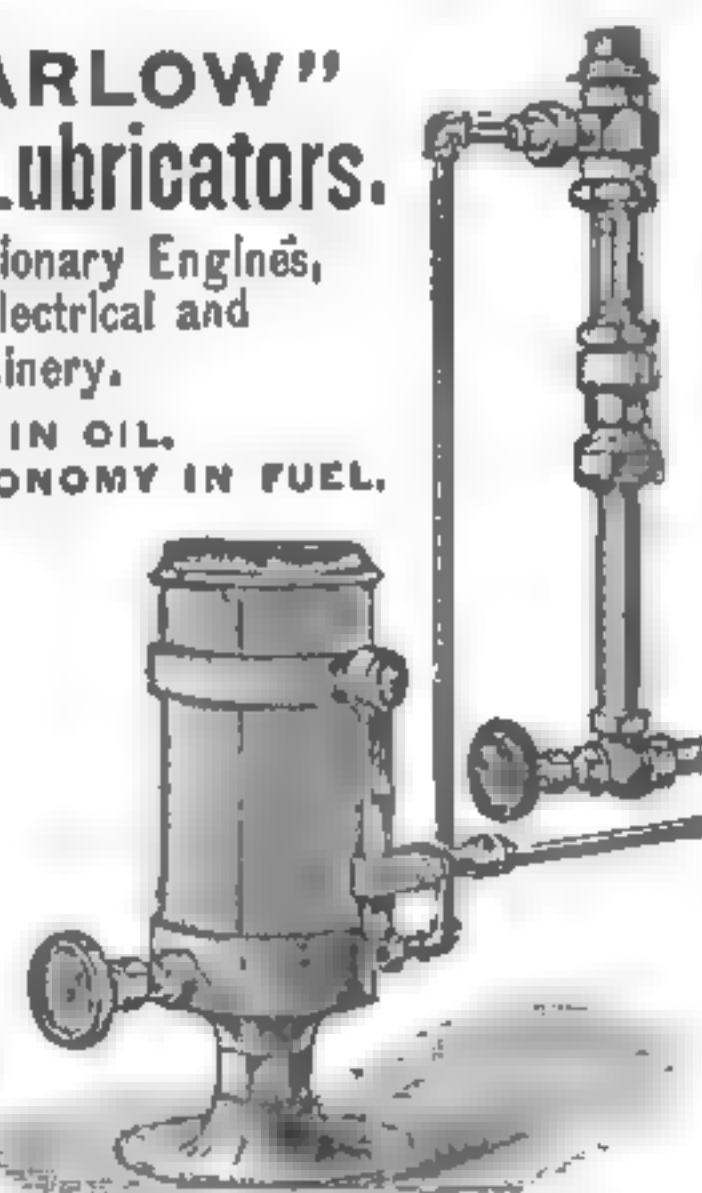
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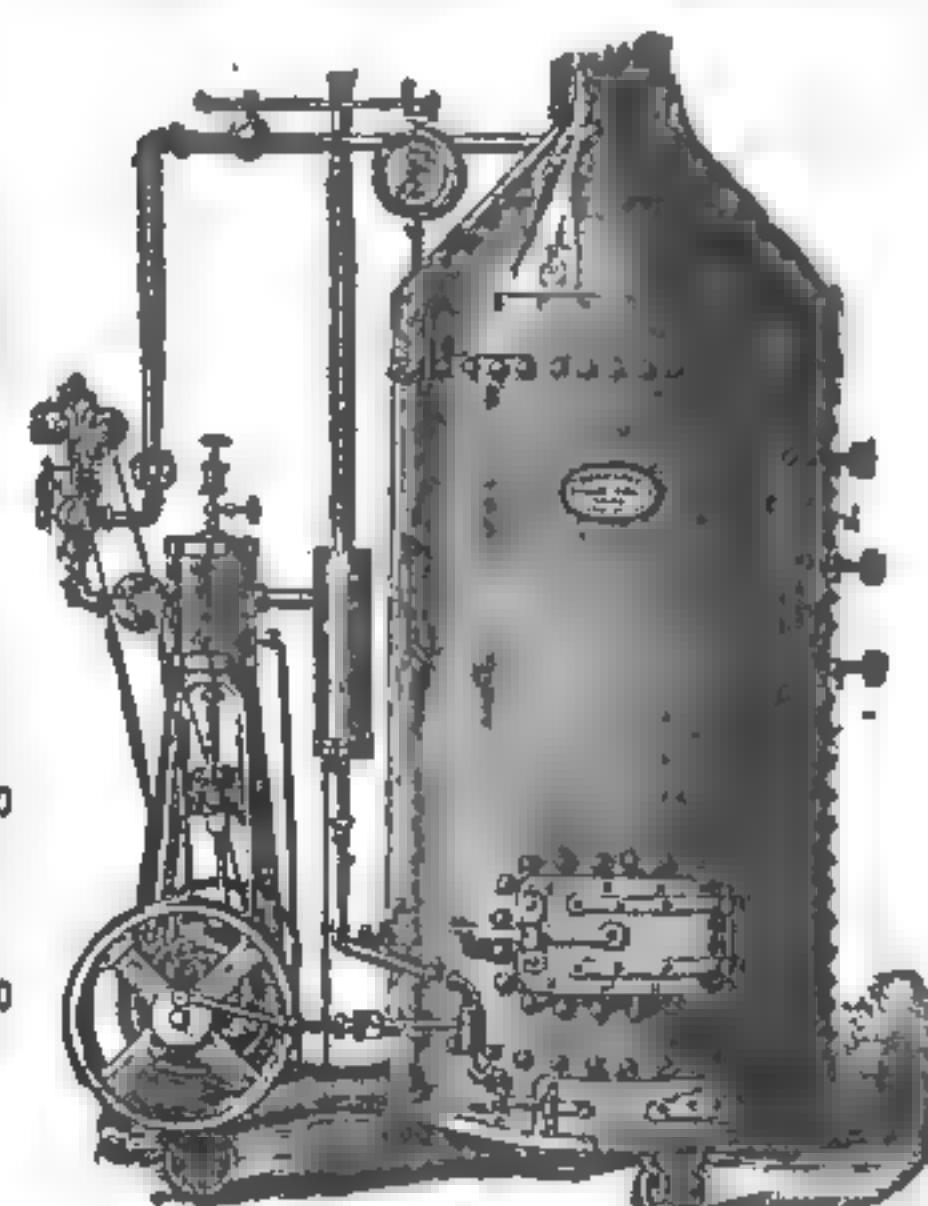


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Pipe Reeds; 5 Octaves; 10 Solo Stops; 2 Octave Couplers
(Bass and Treble); 2 Knee Swells and all late improvements.
Dimensions.—60 in. high, 48 long, 21 wide.

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SOLID WALNUT CASE, HIGHLY FINISHED.
Handsome Stool and Large Instruction Book, making
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HOW TO ORDER. Send a reference as to
any Banker, Postmaster, Merchant or Express Ag'ts
and Organ will be shipped at once on Ten Days'
Test Trial, and if not, after trial, satisfactory, you
can return it and we will pay freight charges both
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NEW JERSEY.**

EUROPEAN ECHOES.

A VIENNA dispatch, dated February 5, says: "A meeting of representatives of agricultural societies has been held at Lemburg to provide means to relieve the sufferers from the famine existing in Russian Poland and Galicia, caused by the failure of the crops."

SAYS the London "Miller" of January 27: Complaints of the condition of wheat samples have been made by most exchanges; still, the soft, open period of the late stormy fortnight has not been of that pervading, clinging dampness that altogether puts grain out of milling condition. Naturally, the country millers are most affected by the condition of farmers' samples, as their grists are now very largely made up of the cheapest supply available, that of their local districts. Town millers have such great resources in choice that the chief difficulty is to get quality of an even grade of excellence, rare in last season's wheat generally, common in the good Russian reserves of 1888. The Argentine Republic is reported to have a "bumper crop" of wheat and maize. The latter is on offer at from 16s. 6d. to 18s., but of wheat the shipments are likely to be deferred for want of means to transport. A total export of half a million quarters is promised. Russia apparently owns a quality of wheat that is in favor with British millers, and stocks are held with persistent firmness. India has given up expectation of an average crop, and so shipments of old and offers of new are less important than usual.

STATISTICIAN Michael G. Mulhall, in his recent book, "Fifty Years of National Progress," of course British progress, says that every British interest, during the Victorian era, has been successful, with the single exception of agriculture. That interest is 6 per cent. lower than it was 50 years ago, and in reference to population it is 33 per cent. lower. Free trade in cereals has wrought the ruin. Mr. Mulhall says: "This industry has so declined in the present reign that the production of grain is now only 3 bushels per inhabitant, against 13 in the years following the Queen's accession." In the same chapter he says: "Capital having an irresistible tendency to run out of losing trades and seek those which are profitable, it is not surprising to see that grain-growing is rapidly diminishing in the United Kingdom." This he shows by official tables, giving the average number of bushels of grain raised therein in the years 1841 to 1850 inclusive, which included the beginning of the Free-Trade era, at 346,000,000 bushels, and contrasts the same with the average of years between 1881 to 1885 inclusive, which were only 306,000,000. That shows a positive decline of about one-eighth, but when it is considered that in the 45 years under review the population had greatly increased, the relative loss in production must have been one quarter or one-third. But, disastrous as was this falling off in quantity, the decline in prices was still more distressing. Mr. Mulhall gives the relative prices per bushel at the beginning of the Free-Trade era and after its establishment, which we render in American from British currency at 2 cents per penny thus:

	Wheat.	Barley.	Oats.
1841 to 1860.....	\$1.62	\$1.02	\$0.68
1881 to 1886.....	1.18	.92	.62

MILLING PATENTS.

Among the patents issued February 11, 1890, are the following:

Hugo Graepel, Budapest, Austria-Hungary, No. 420,934, a grinding-mill, consisting of a revolute drum composed of concentric screens varying in the size of their meshes, a series of radial chambers formed by perforate partitions encompassed by said screens, loose rolling crushers contained in said chambers, and ducts between the concentric screens and peripheral walls of the chambers for conducting the material passing through the perforate walls of the latter to the inner screens and returning the material too coarse to pass through either screen back into the crushing-chambers.

Theodore Ponsar, Talmage, Neb., No. 420,957, a middlings-purifier, consisting, essentially, of a main case, having an elevated fan-chamber in its top, horizontal partitions arranged to form a passage in the upper portion of the case, valves arranged in said passage, valve-openings in said partitions, deflectors arranged above said openings, the feed-tube having a cone distributor, an opening communicating with the valved passage, and an opening communicating with the upper screen, the lower screen having a hopper at its upper end and connected with the upper screen by transverse walls, endless carriers provided with clearing-brushes arranged beneath the respective screens, a discharge-spout at the tail end of each screen, and a discharge-spout at the head end of the lower endless carrier, and slotted spring-arms for adjustably supporting the screen in the casing.

Milo J. Althouse, Waupun, Wis., No. 421,063, a grinding-mill, a vertical disk-grinder, having the fixed grinding-disk and the horizontal shaft provided with a grinding-disk and a driving-pulley and mounted to move endwise in its bearings, in combination with the tempering-screw acting on the shaft to approximate the disks and the weighted lever, as distinguished from a spring acting on the shaft to separate the disks, whereby the disks may be adjusted to run close together without danger of their being thrown together by vibration of the driving-belt, and having a grinding-disk provided with the feeding-furrows, the diamond dress immediately encircling the same and acting to grind the material back and forth, and the peripheral teeth having the abrupt forward faces and cutting-edges encircling the diamond dress and arranged to receive and reduce the material delivered from the diamond dress.

Robert Whitehill, Milwaukee, Wis., No. 421,215, a dust-collector, consisting of the combination of a suitable main casing provided with a wind-trunk to receive dust-laden air, a series of fan-cases arranged within the main casing and composed of suitable heads united by longitudinal sections eccentric to the axial centers of said heads and these sections arranged to leave an opening between the opposing edges of each two thereof, a drum centrally fitted in each fan-case to be open at one end, and also provided with an opening in its periphery, wind-trunks alternately arranged between and communicating with said fan-cases, a series of fans severally arranged to operate within the respective fan-cases, and suitable means for actuating the fans.

Henry Gschwendee, Winona, Minn., No. 421,369, a grain-scourer, comprising the combination with an upright cylindrical drum having a grain inlet and outlet, respectively, located in the top and bottom thereof, the inlet being near the center of the end of the drum and the outlet at the center of the bottom, and a similarly-shaped rubber mounted upon an upright shaft within the drum and means for operating the same, a valve having a weighted arm acting normally to close the said outlet, and a worm projection upon the end of said rubber working in said outlet to force the grain through said outlet, whereby the grain is retained within the drum until thoroughly scoured.

BOOKS AND PAMPHLETS.

Francisque Sarcey and Emile Zola take diametrically opposite views, in the *Transatlantic* of February 15, regarding Tourgenieff's play, "Bread of Another," which was originally produced in Russia when the author was a young man, and was never played again until the manager of the Theatre-Libre of Paris revived it a few weeks ago. Zola strongly denounces the Parisian audience for hissing the piece, while Sarcey as stoutly maintains that the portrayal of Russian customs of half a century ago could not fail to arouse a feeling of revolt in Frenchmen. A magnificent head of Tourgenieff enhances the beauty and interest of this magazine's always attractive cover. A Russian writer, S. Miklashevsky, sketches "Progress in Persia" very instructively. A new serial is begun in this number, "On the Mountain," from the Italian of Signora Caterina Pigorini Beri. Guy de Maupassant, in his "Vagrant Life," gives a charmingly unique description of a night on the Mediterranean on board a yacht. Jean Reibrach contributes a thrillingly tragic novelette, entitled "Claudine." There is a long poem by Victor Hugo, "Ibo," characterized by all the French master's grandeur of conception and phrase. The musical selection is "The Duet of the Saints," written by Charles Gounod for Barbier's drama, "Jeanne d'Arc," in which Sarah Bernhardt is now scoring in Paris the greatest success of her life. [328 Washington St., Boston, \$2.00 year.]

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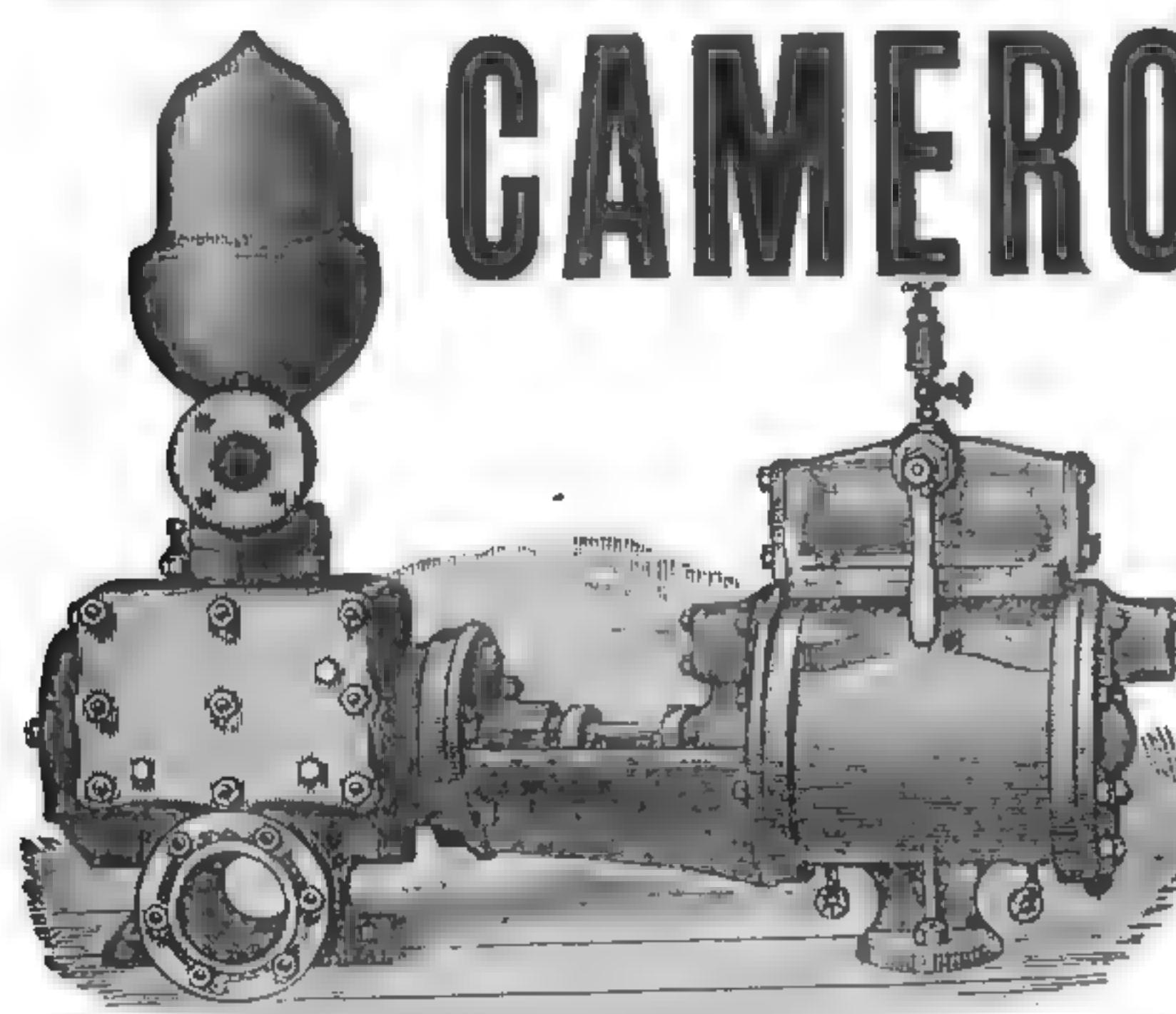
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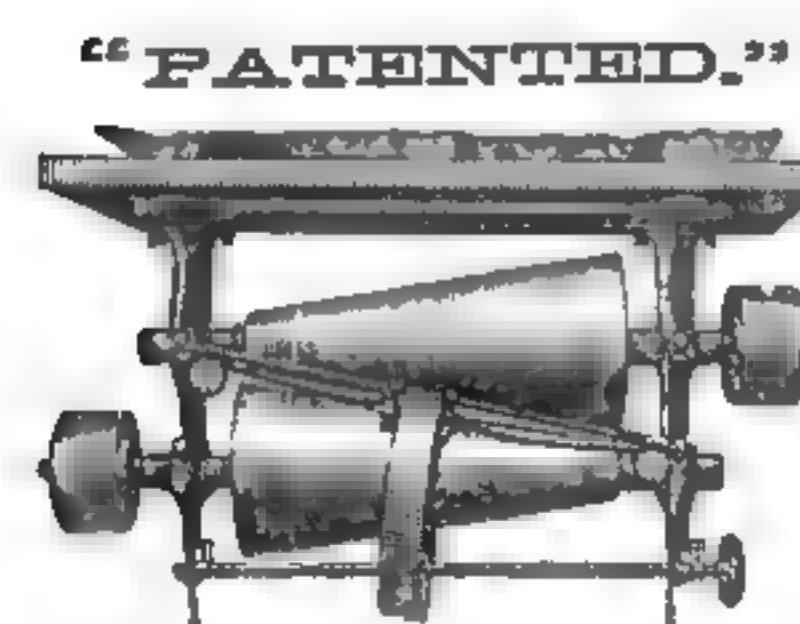
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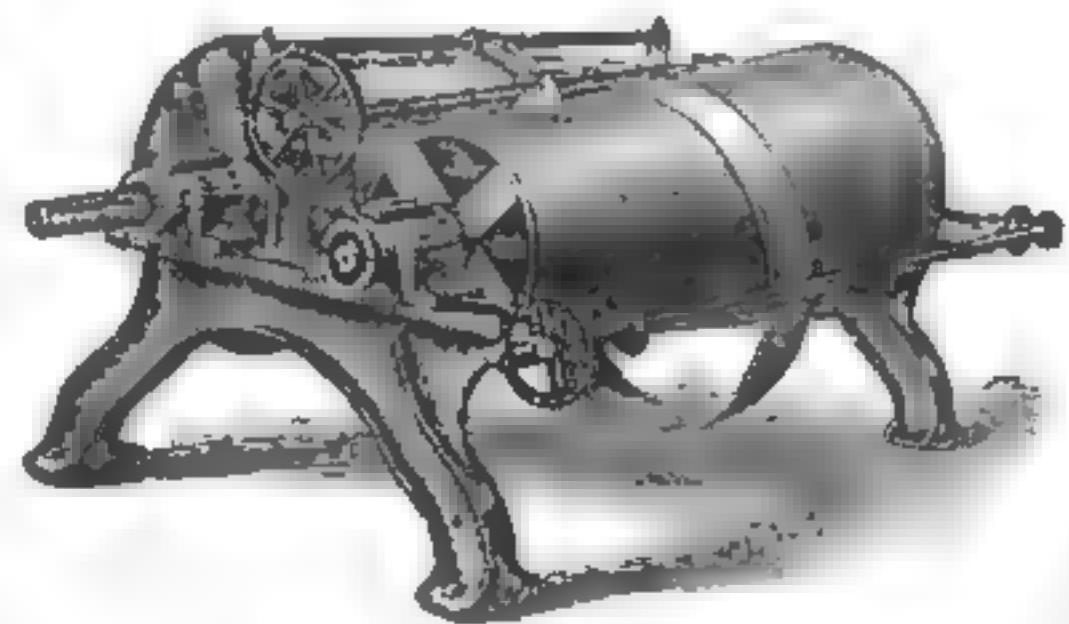


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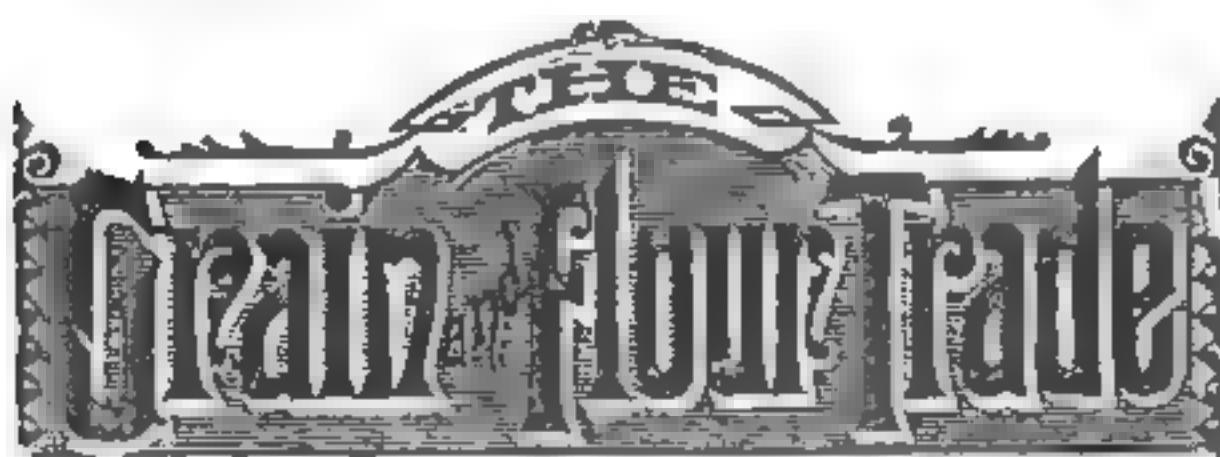
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SHELL UNHUSKED CORN AND CLEAN IT PERFECTLY.

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NAME THIS PAPER.



OFFICE OF THE MILLING WORLD,
BUFFALO, N. Y., Feb. 15, 1890.

Friday of last week brought lower and irregular markets, with a general slight rally at closing. February wheat closed at 84½c., with receipts 38,056, exports 36,542, and options 3,224,000 bushels. February corn closed at 36c., with receipts 479,473, exports 448,143, and options 2,768,000 bushels. February oats closed at 28½c., with receipts 108,285, exports 33,561, and options 260,000 bushels. Wheat flour was inactive generally and unchanged. Receipts included 5,596 sacks and 29,289 barrels, and exports 35,217 sacks and 9,934 barrels.* The minor lines were without marked features.

Saturday brought quiet but rather stronger markets, on firmer cables, shorts covering and lighter receipts. February wheat closed at 84½c., with receipts 33,320, exports 146,148, and options 1,200,000 bushels. February corn closed at 36½c., with receipts 472,048, exports 304,268, and options 240,000 bushels. February oats closed at 28½c., with receipts 152,940 and exports 11,828 bushels. Wheat flour was slow and practically nominal, excepting clear springs and patent springs in sacks, which cheaper ocean freights made in better demand. Receipts 12,978 sacks and 23,616 barrels, and exports 17,440 sacks and 1,178 barrels. The other lines were unchanged.

Monday brought a mixed condition, with better cables and lower and weaker markets on shorts selling, longs realizing and the West unloading. February wheat closed at 84½c., with receipts 25,327, exports 30,742, and options 1,440,000 bushels. February corn closed at 35½c., with receipts 555,082, exports 241,669, and options 4,100,000 bushels. February oats closed at 28½c., with receipts 195,137, exports 71,116, and options 200,000 bushels. Wheat flour was more regular with some jobbing inquiry. Export demand was limited principally to bakers' springs and winter patents. Receipts were 11,830 sacks and 30,000 barrels, and exports 7,485 sacks and 3,264 barrels. The other lines were unchanged. The visible supply in the United States and Canada was:

	1890.	1889.	1888.
	Feb. 8.	Feb. 9.	Feb. 11.
Wheat	30,755,758	34,190,376	40,287,617
Corn.....	18,036,437	14,035,108	8,339,156
Oats.....	5,492,084	8,079,829	5,181,537
Rye	1,460,000	1,697,916	361,283
Barley	1,751,701	2,236,805	2,803,160

Tuesday brought dull, weak and declining markets, without speculative or spot demand, excepting small orders to cover shorts. February wheat closed at 84½c., with receipts 16,698, exports 57,095, and options 1,320,000 bushels. February corn closed at 35½c., with receipts 585,798, exports 529,429, and options 2,500,000 bushels. February oats closed at 28½c., with receipts 135,000, exports 105,378, and options 200,000 bushels. Wheat flour was duller, with buyers demanding concessions. Receipts included 10,000 sacks and 20,000 barrels, and exports 19,261 sacks and 832 barrels. The minor lines showed no marked changes, and trade generally was slow in all lines.

The following shows the amount of wheat and flour, together with the amount of corn on passage to United Kingdom, for ports of call or direct ports for the weeks mentioned:

	1890.	1889.
	Feb. 11.	Feb. 12.
Wheat and flour, qrs....	2,134,000	2,307,000
Corn, qrs.....	510,000	298,000

The following shows the amount of wheat and corn on passage to the Continent for the past week and for the same week last year:

	1890.	1889.
	Feb. 11.	Feb. 12.
Wheat, qrs.....	401,000	439,000
Corn, qrs.....	340,000	161,000

Shipments India wheat to U. K..... None.
do do Continent..... None.
The imports into the United Kingdom for the past week and for the same weeks in previous years were as follows:

	1890.	1889.	1888.
	Feb. 11.	Feb. 4.	Feb. 12.
Wheat, qrs.....	135,000	194,000	74,000
Corn, qrs.....	143,000	164,000	131,000
Flour, bbls.....	167,000	199,000	120,000

Wednesday brought a ripple of excitement and activity in the markets. There was heavy selling in the western markets, and the New York market broke sharply after opening, to rally slightly before closing. Lower cables for corn depressed that line, and the Chicago clique in oats crawled out, letting that line down. The result was a good export trade in wheat, oats and corn. February wheat closed at 84½c., with receipts 40,284, exports 49,681, and options 10,000,000 bushels. February corn closed at 35½c., with receipts 412,589, exports 605,026, and options 2,480,000 bushels. February oats closed at 27½c., with receipts 152,719, exports 9,565, and options 1,000,000 bushels. Buckwheat grain was 40@42c. for choice. Rye grain was quoted at 52@54c. for ungraded on track, and 55@57c. delivered, with No. 2 Western at 55c., and No. 1 State at 58c. Barley was dull at the following quotations: Two-rowed State 50@51c. for prime; six-rowed do 54@57c.; extra No 2 Canada 62@63c.; No. 2 do 59@60c.; ungraded do 59@69c.; Western 49@55c. Malt was neglected and nominal. Quotations: Canada country-made 75@80c.; city 80@90c.; six-rowed 75@80c.; two-rowed 65@70c.; Western 60@85c. Mill-feed was firm and quiet, on moderate offerings, with some city mills sold ahead and out of the market on 40 and 60 lbs. Demand was also slow and for small lots; 100 tons winter middlings sold at \$15.25, for export.

Wheat flour was dull and featureless, all buyers being driven off by the drop in wheat. The only purchases made were for forced needs. Receipts included 8,702 sacks and 20,675 barrels, and exports 24,163 sacks and 8,919 barrels.

Minneapolis reports an output of about 116,000 barrels of flour the past week. Rye flour was dull at \$2.75@2.90. Buckwheat flour was steady and dull at \$1.40. Corn products were dull and easier at the following quotations: Brandy wine and Sagamore \$2.60; Southern and Western \$2.40@2.55; coarse, in bags, 70@75c.; fine white and yellow 80@89c.; brewers' meal at 99c@\$1.04.

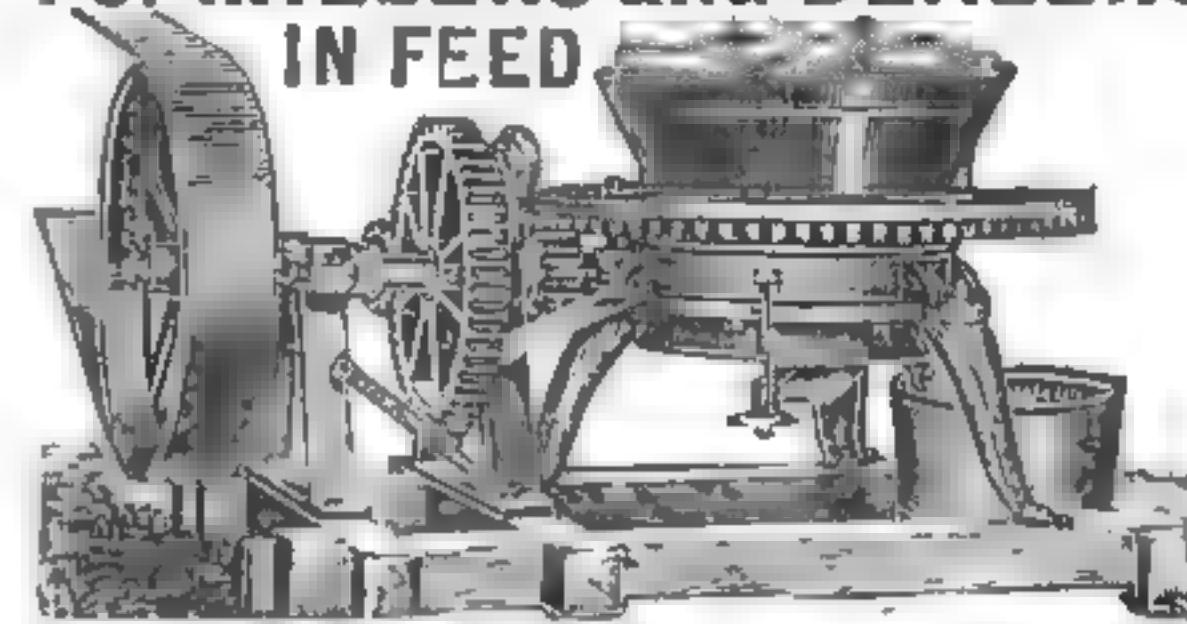
Thursday brought slight change in the conditions. February wheat closed at 84½c., with receipts 14,850, spot sales 76,000, and options 4,000,000 bushels. February corn closed at 35½c., with receipts 175,800, exports 88,880,

options 1,944,000, and spot sales 327,000 bushels. February oats closed at 27½c., with receipts 112,000, spot sales 114,000, and options 475,000 bushels. Wheat flour was weak, with receipts 8,029 packages, and sales 17,650 barrels. Sales were made at the following quotations: Low extras \$2 15@2.65; city mills \$4.25@4.45; city mills patents \$4.65@5.25; winter wheat low grades \$2.25@2.65; fair to fancy \$2.85@4.45; patents \$4.15@4.90; Minnesota clear \$3.10@4.05; Minnesota straights \$3.65@4.50; Minnesota patents \$4.15@5.10; Minnesota rye mixtures \$3.10@3.60; superfine \$2.00@2.65. The other lines were featureless.

BUFFALO MARKETS.

WHEAT—The market is dull at previous or lower prices. Some 18,500 bushels of No. 1 hard was sold at 88½c.; No. 1 Northern is quotable at 88½c.; No. 2 do at 82@82½c.; No. 2 red winter at 83@82½c.; No. 2 white at 77@78c., and No. 3 do at 76c. **CORN**—The market is firmer. No. 3 yellow sold at 83c., but at the close 33½c. was asked and 33c. refused. Some no grade sold at 29½c. **OATS**—No. 2 white oats is held at 27½c., No. 3 white at 26½c., No. 2 mixed at 26½c., and No. 3 mixed at 25½c. The market is steady at these prices. **RYE**—Some No. 2 was sold at 50c. There is little demand. **BARLEY**—There is no change to report. No. 1 Canada is quoted at 65c.; No. 2 do at 58@61c., and No. 3 at 52@56c. Western sells at 46@50c., and State at 48@56c. **OATMEAL**—Akron, \$6.00; Western, \$5.75 per bbl.; rolled oats, in cases, 72 lbs., \$9.25. **CORNMEAL**—Coarse, 80@85c.; fine, 85@90c.; granulated, \$1.50 per cwt.

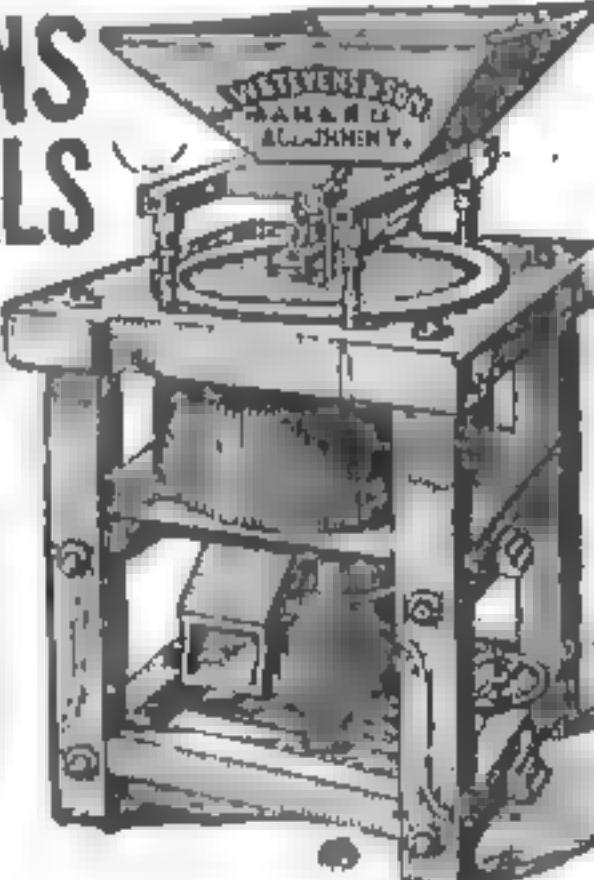
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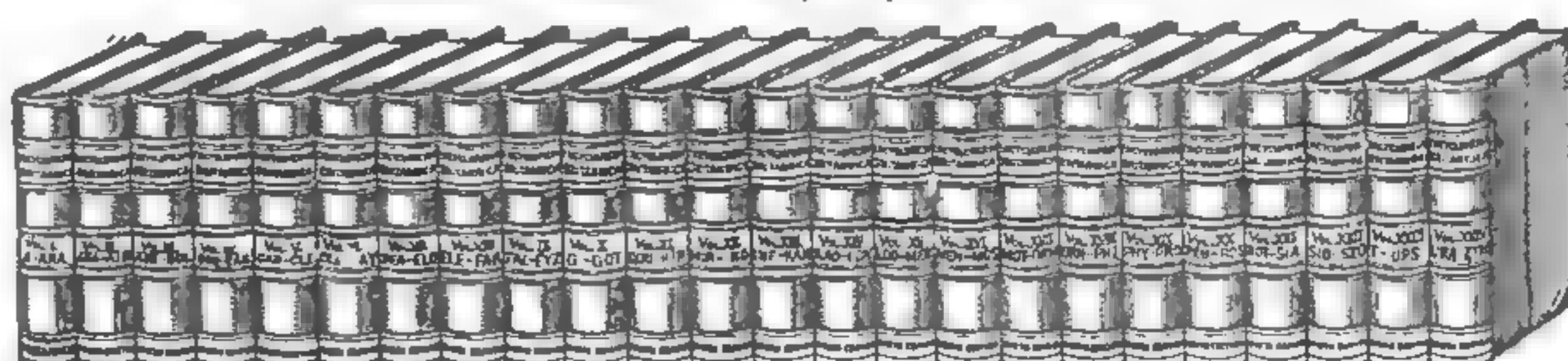
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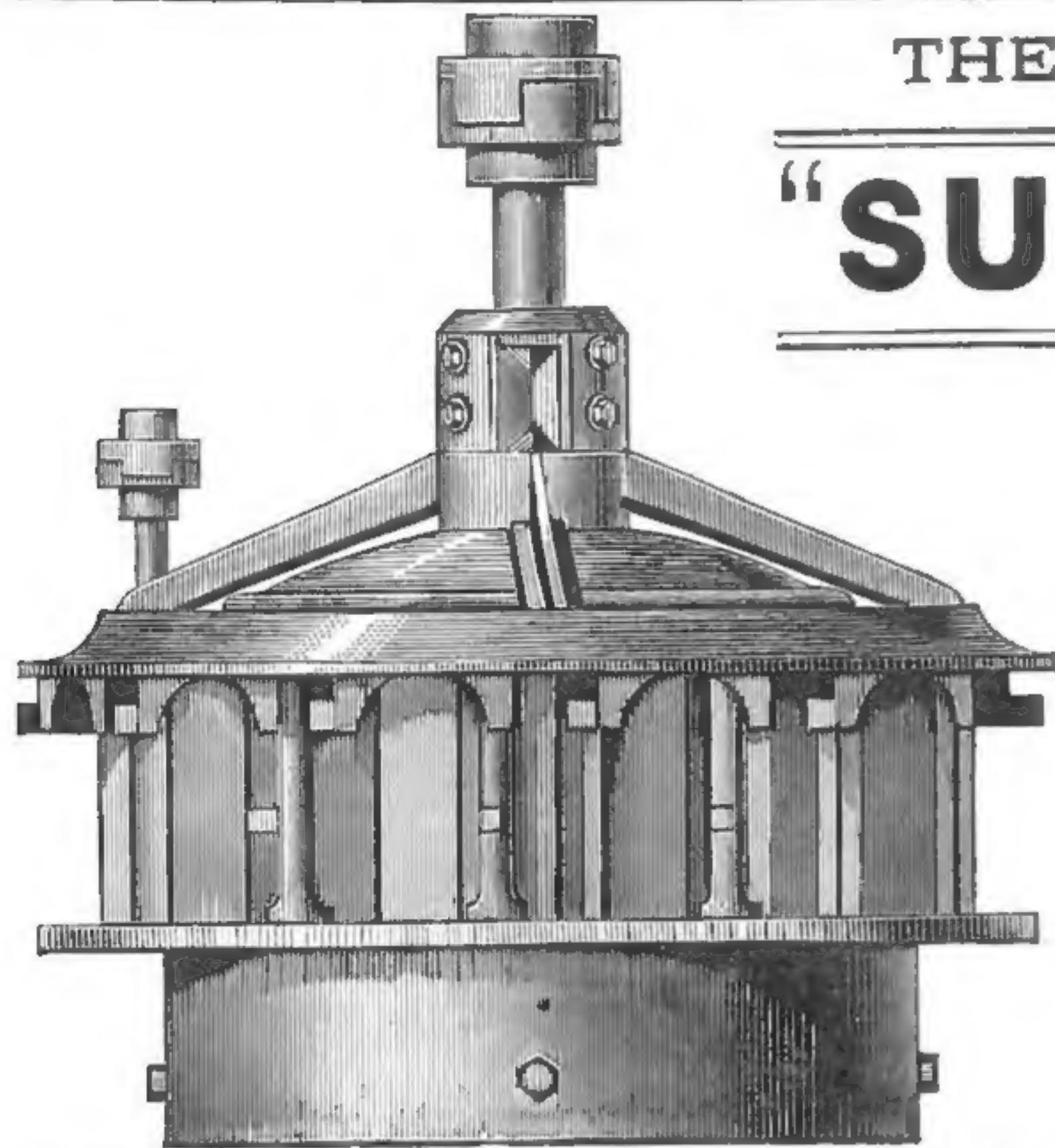
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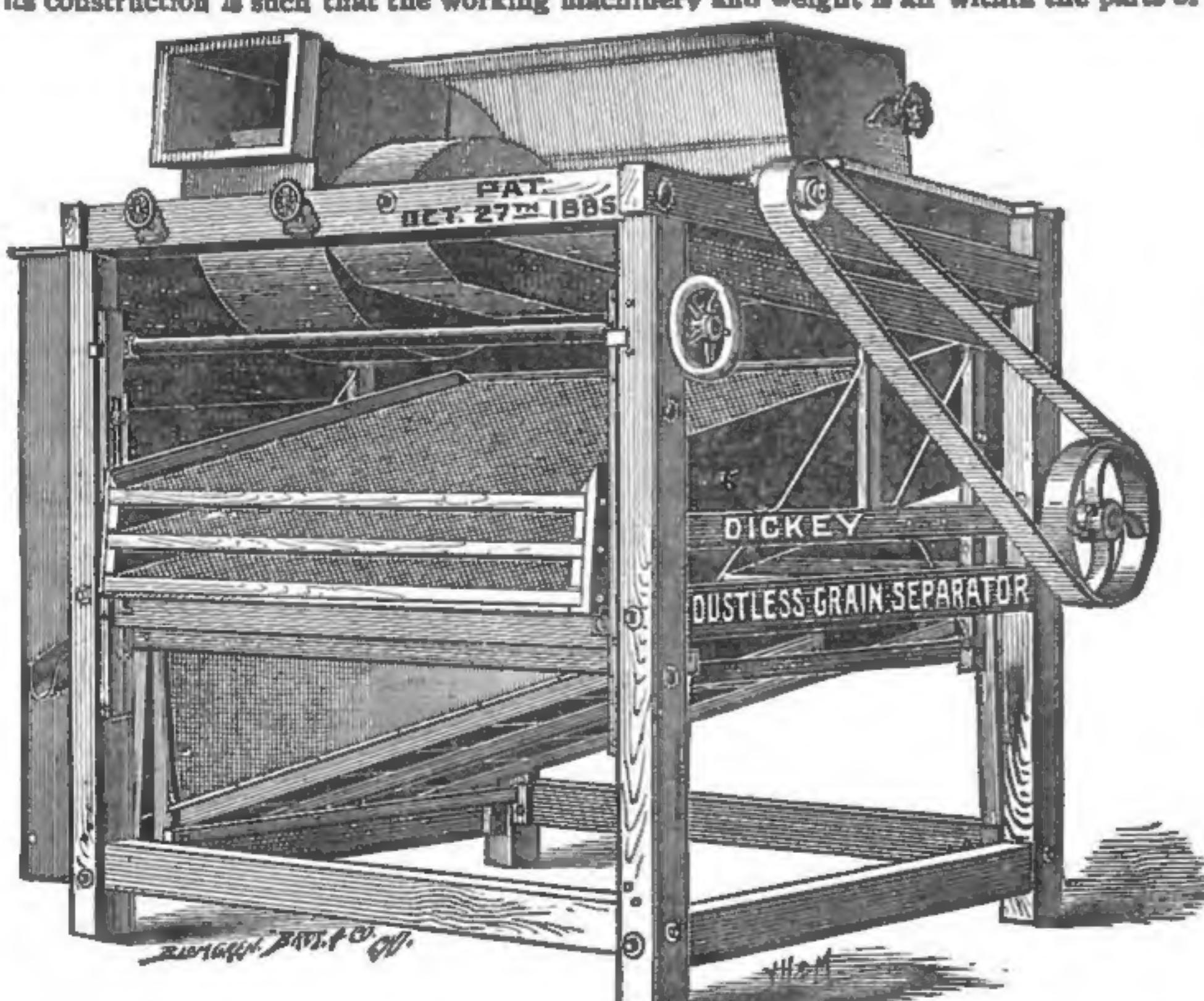
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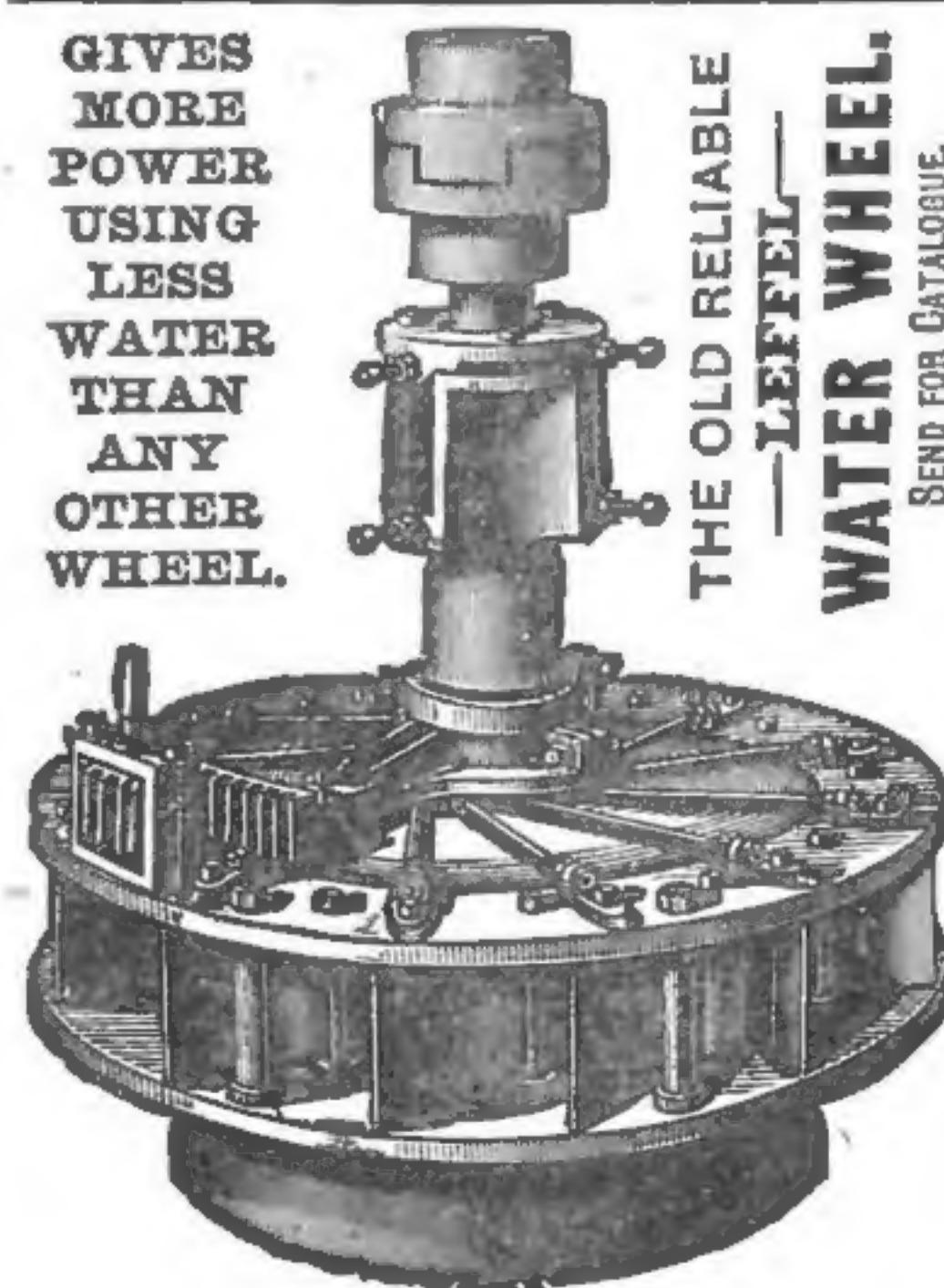
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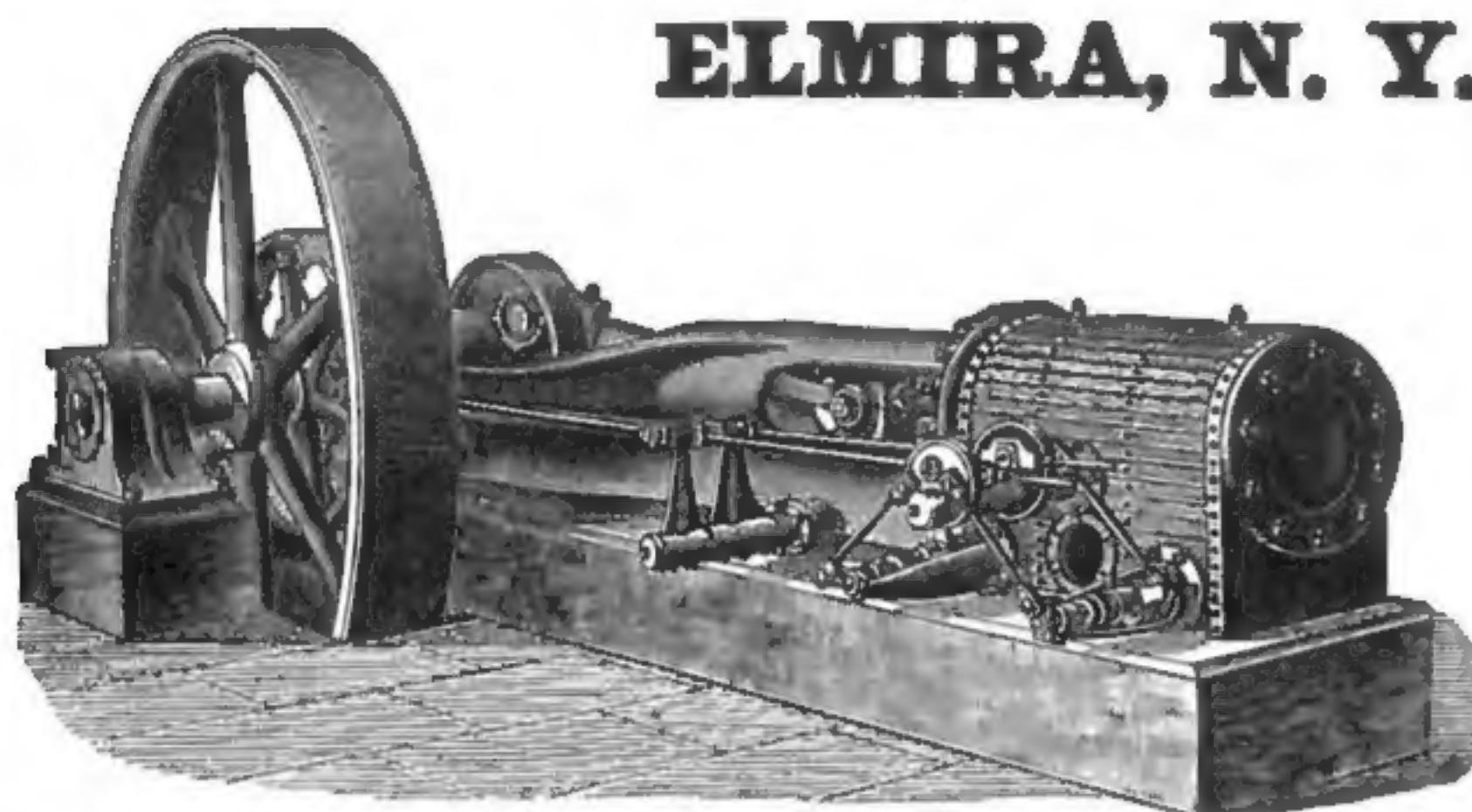
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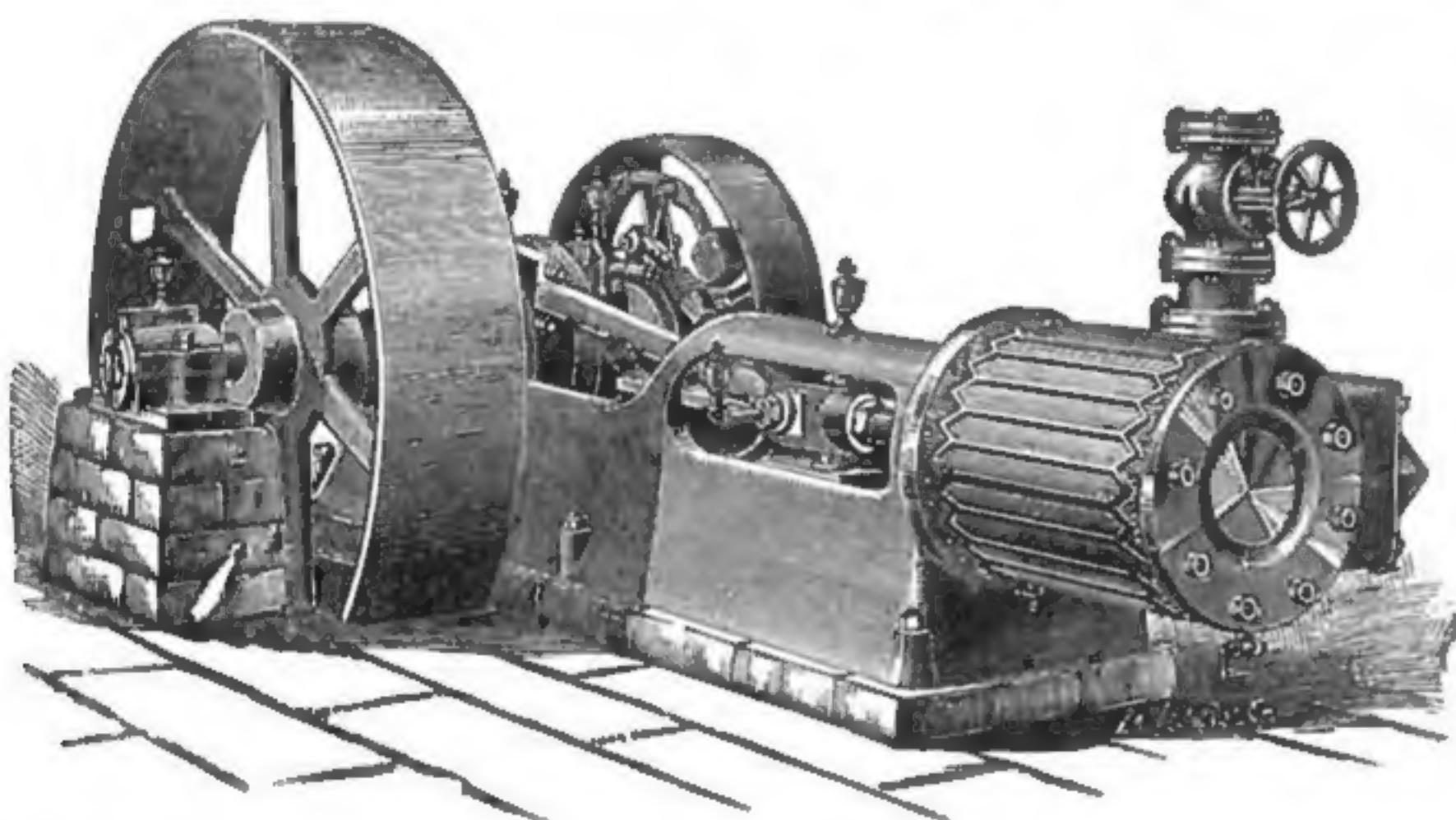
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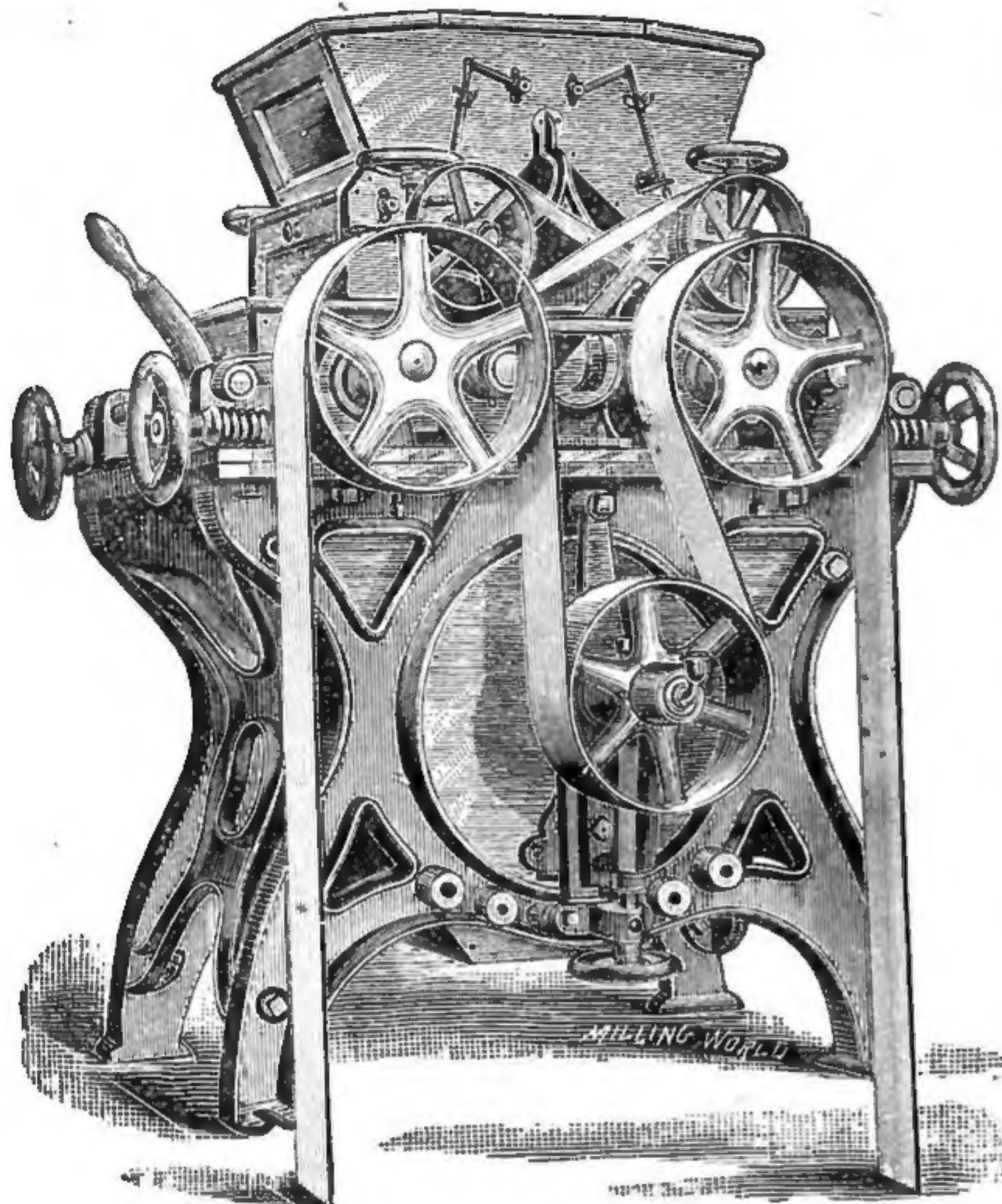
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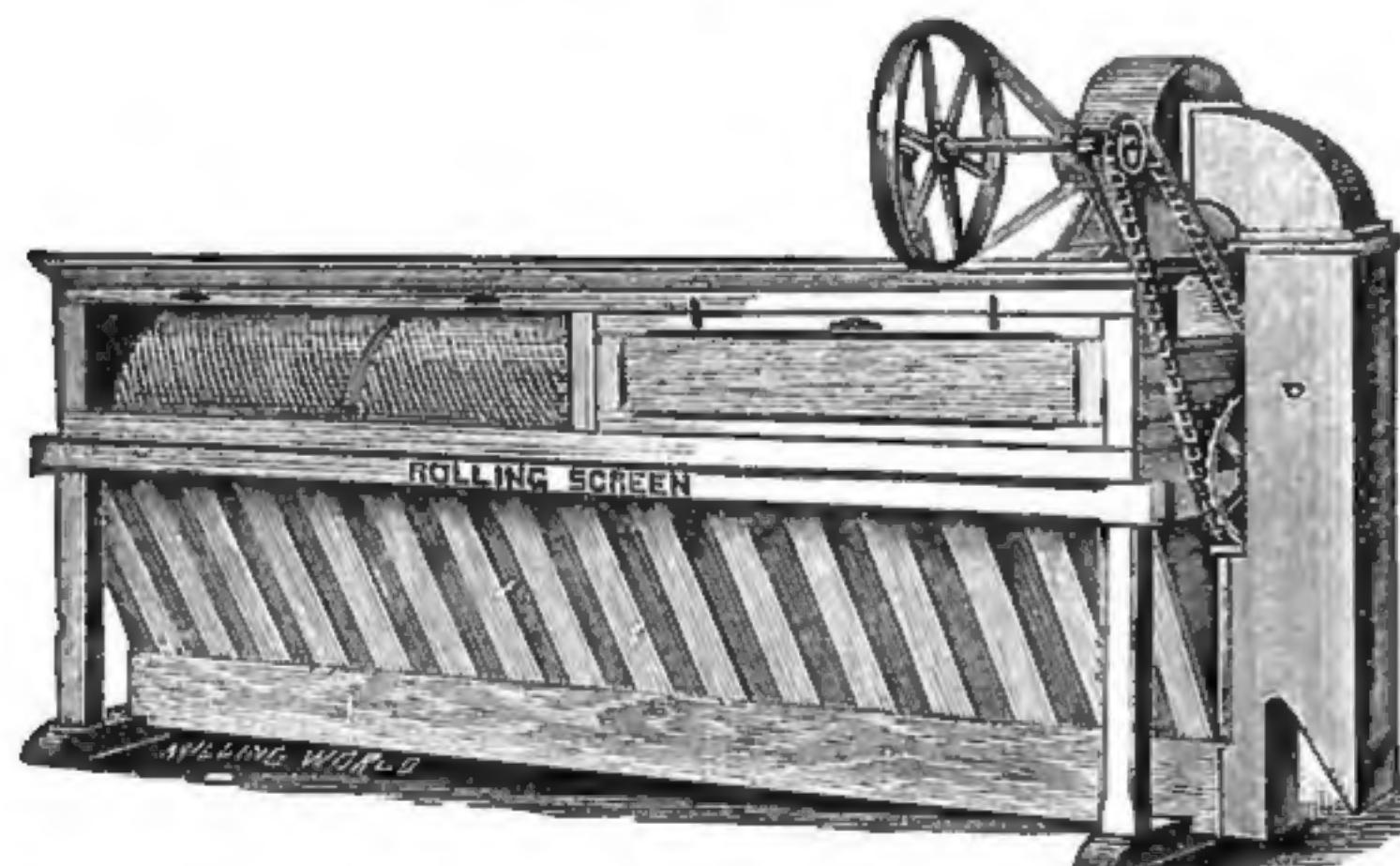
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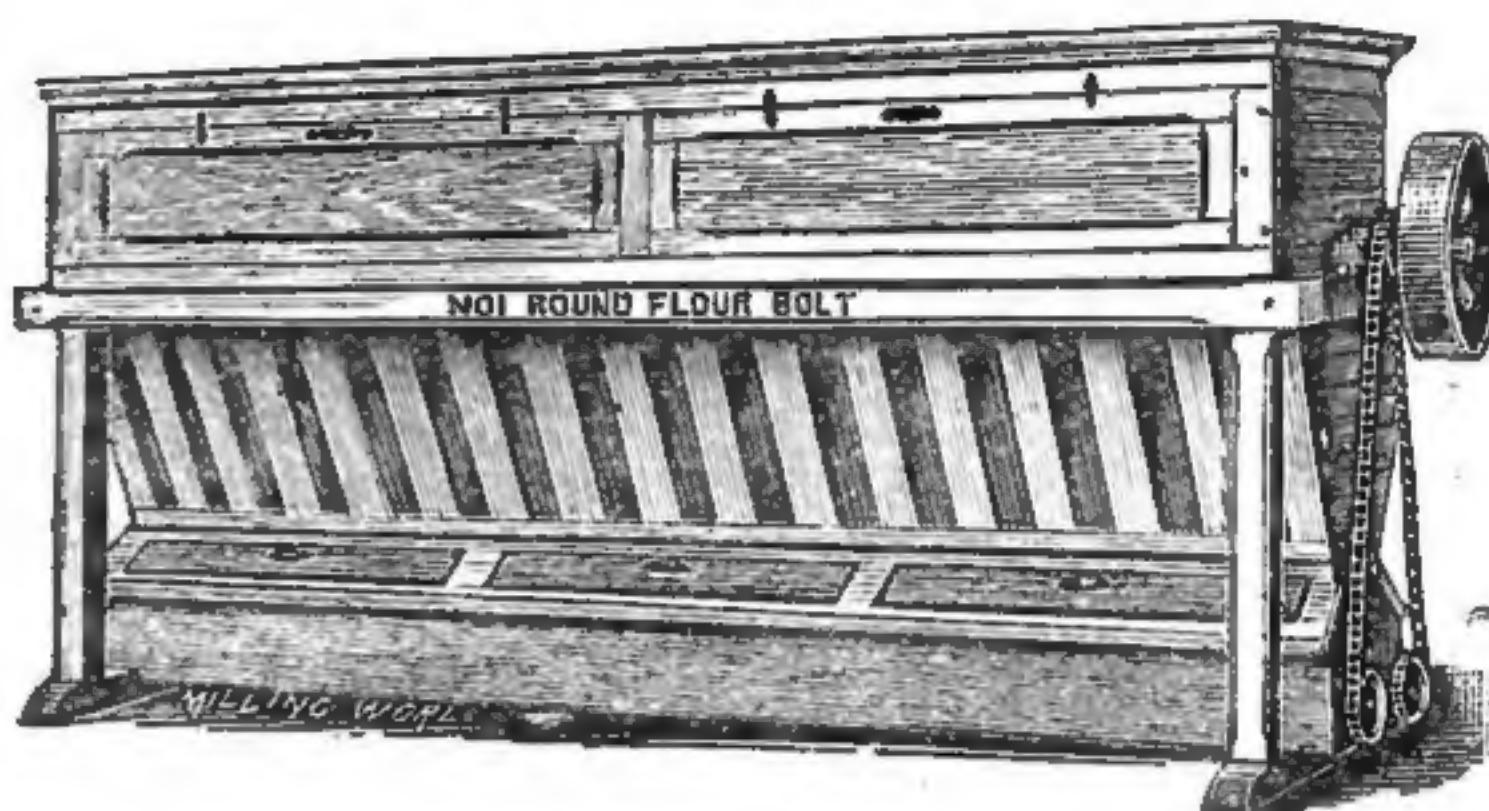
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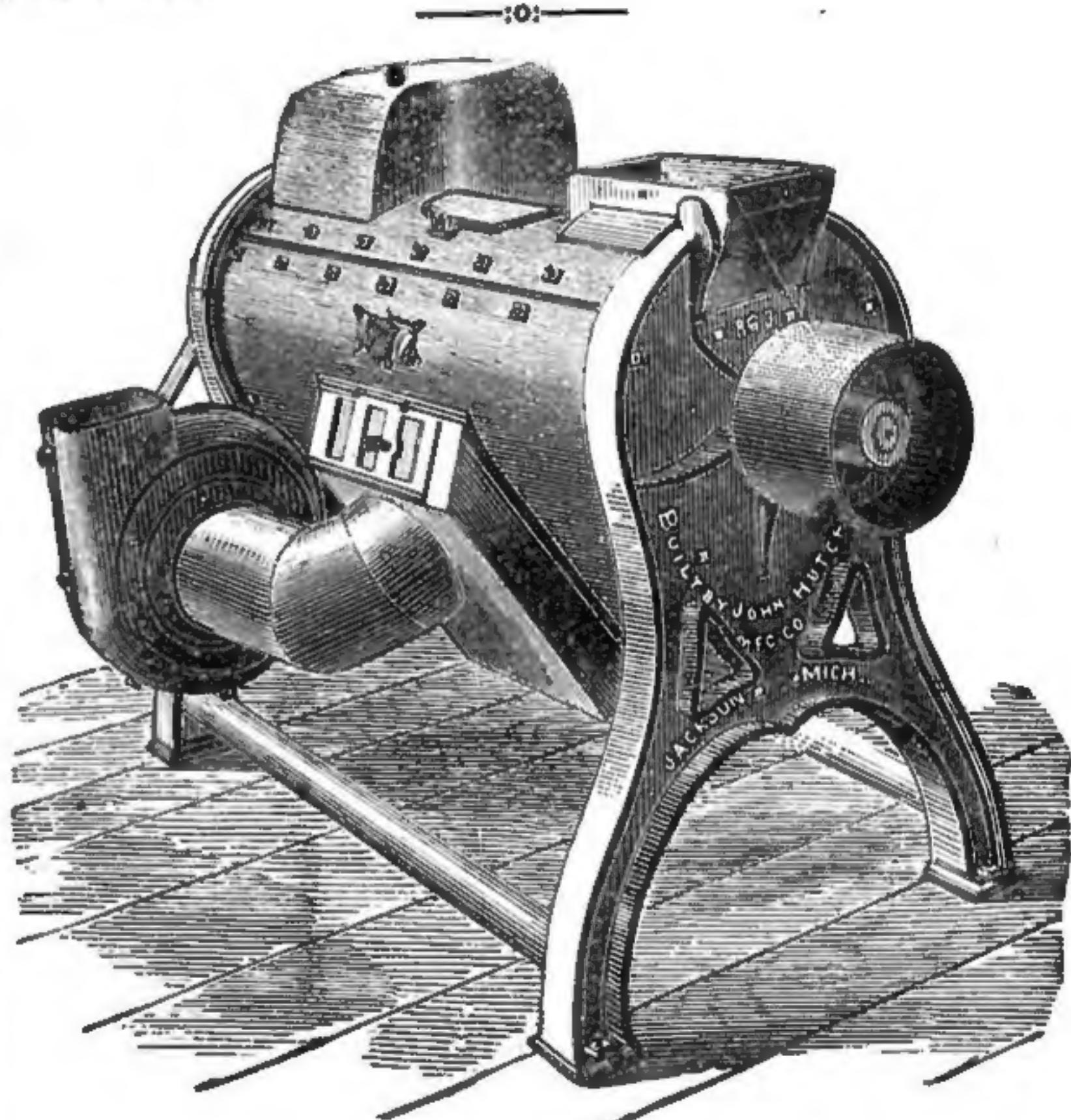


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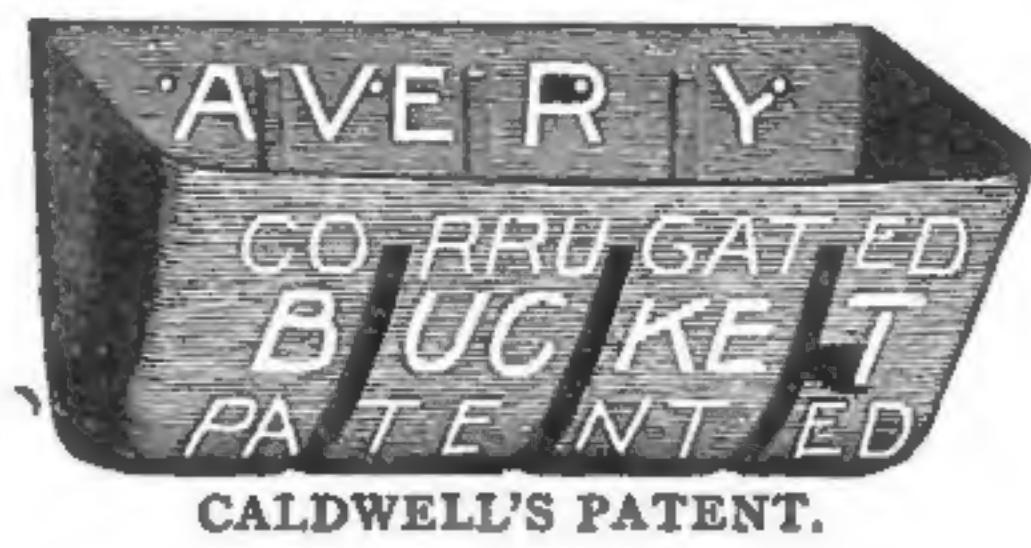
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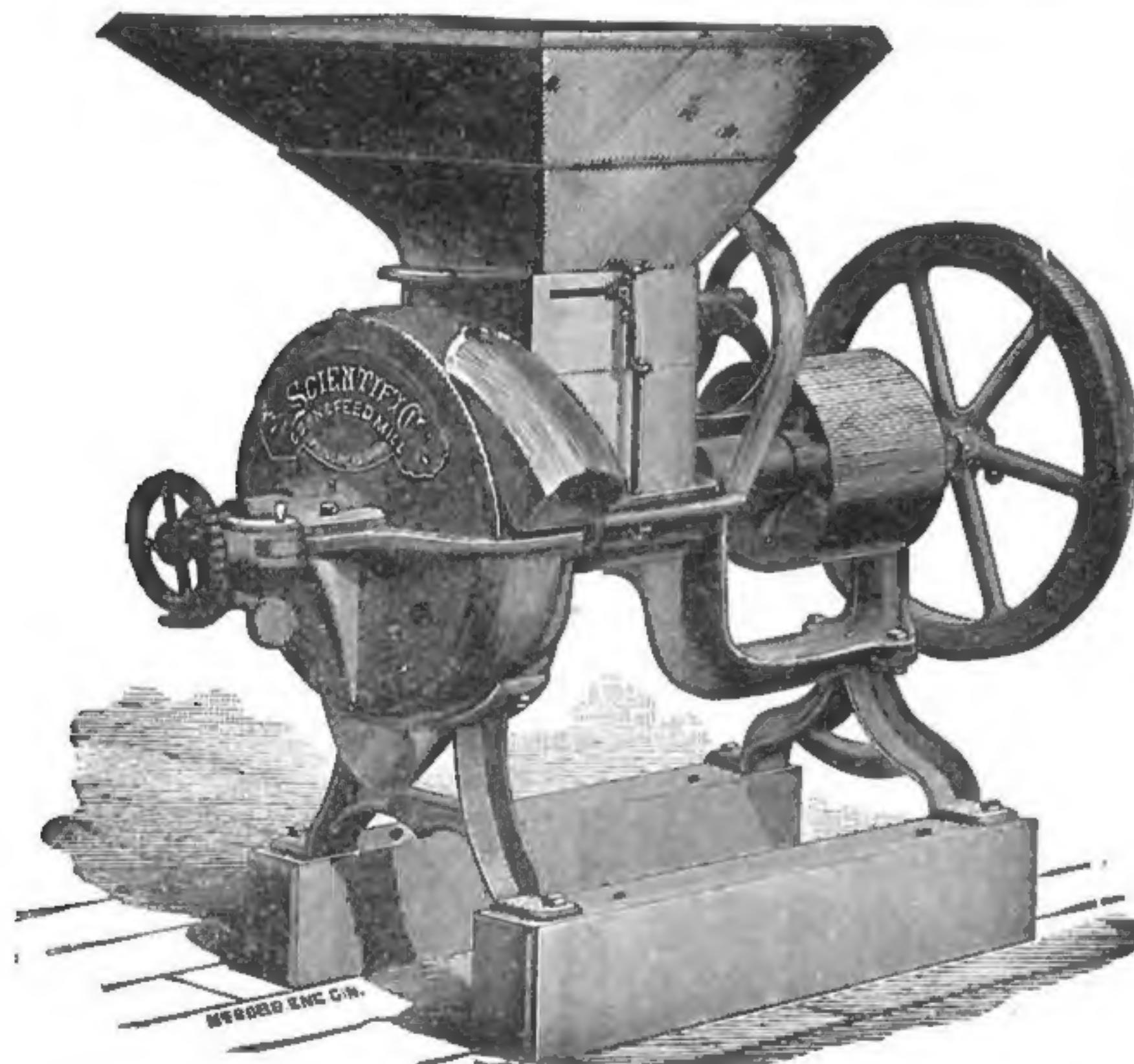
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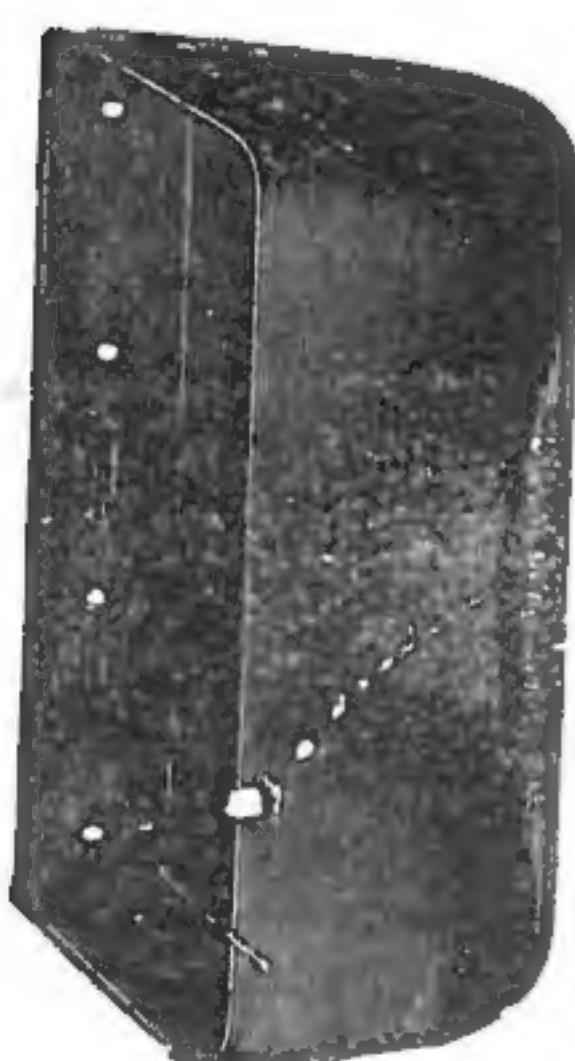
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